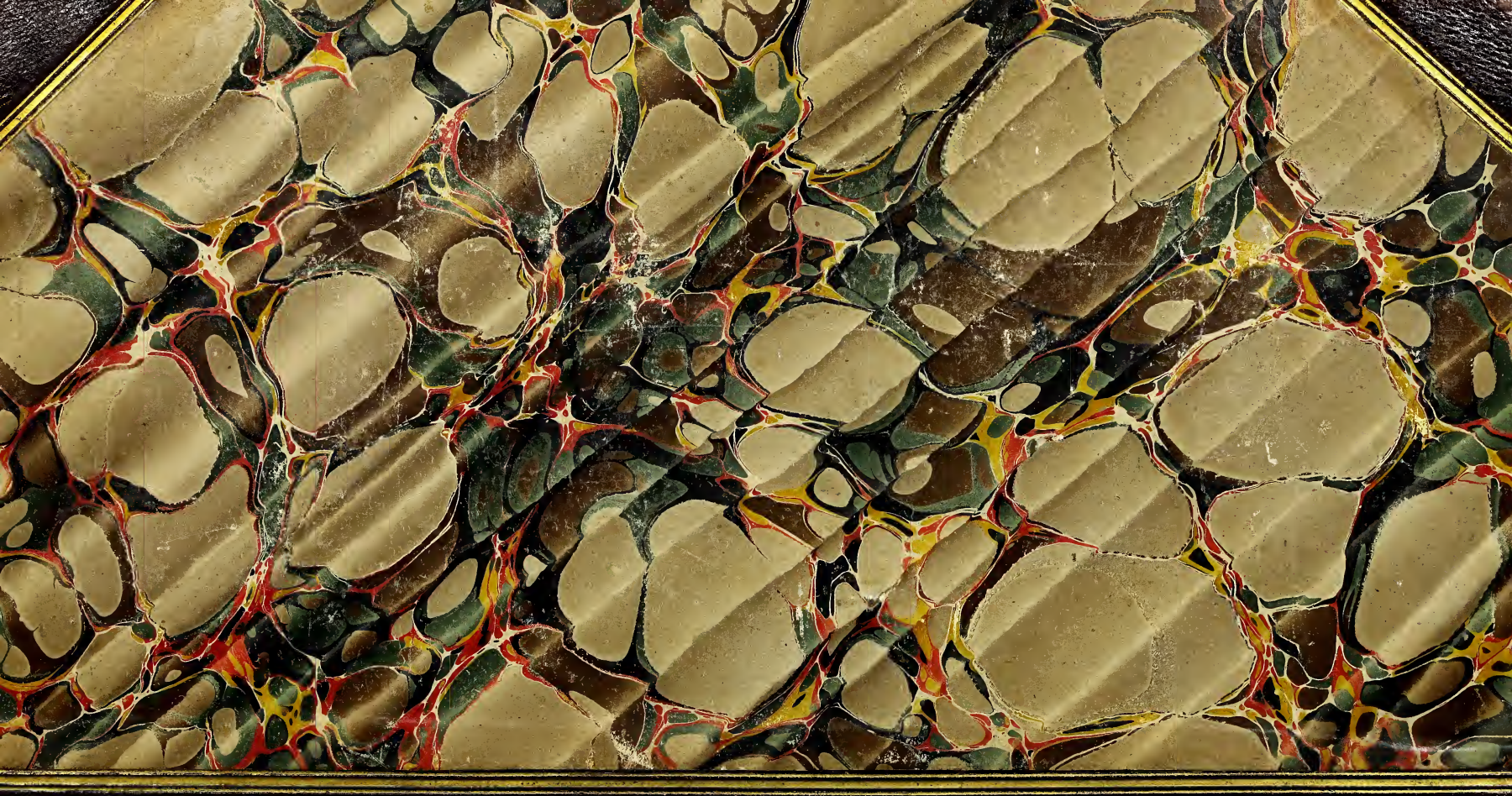

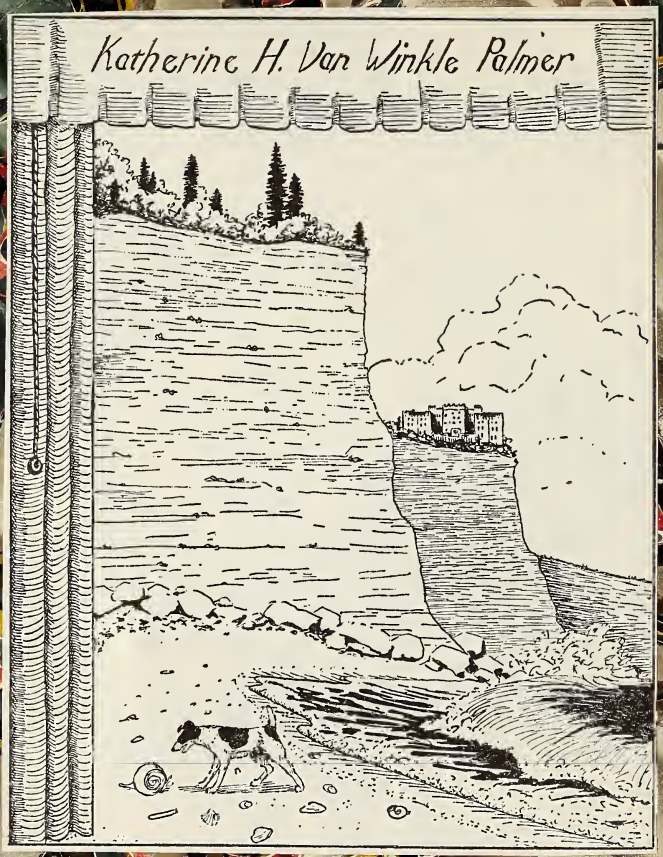
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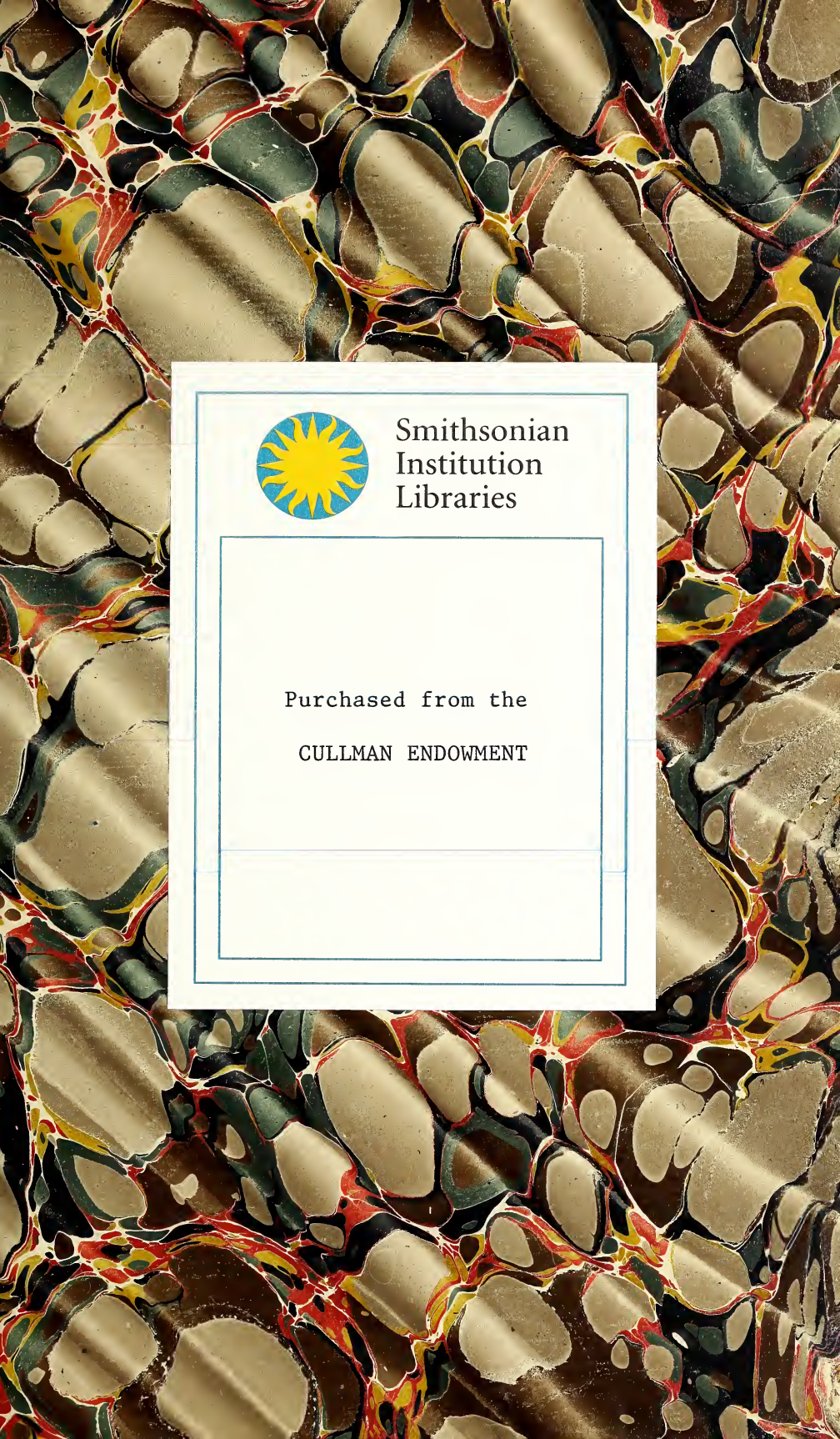
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THE

MINERAL CONCHOLOGY

OF

GREAT BRITAIN;

OR

COLOURED FIGURES AND DESCRIPTIONS

OF THOSE

REMAINS OF TESTACEOUS ANIMALS

OR

Shells,

WHICH HAVE BEEN PRESERVED AT VARIOUS TIMES AND DEPTHS IN THE EARTH.

By JAMES SOWERBY, F.L.S. G.S. W.S. &c.

AUTHOR OF BRITISH MINERALOGY, EXOTIC MINERALOGY, BRITISH MISCELLANY, ENGLISH FUNGI, AND A BOTANICAL DRAWING BOOK;

PUBLISHER OF ENGLISH BOTANY, &c.

Many, O Lord my God, are thy wonderful works which thou hast done: they cannot be reckoned up in order to thee: if I would declare and speak of them, they are more than can be numbered.

PSALM xl. 5.

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TO

JOHN BAKER, Esq. F. L. S. &c.

Whose long friendship and gentle manners, with a constant attachment to useful pursuits, has long pleasingly engaged my esteem and gratitude, I beg permission to dedicate this part of my labours. That he may partake of that happiness he constantly deals to others, is the fervent hope of his most humble and faithful Servant,

JAMES SOWERBY.

2, Mead Place, Lambeth,
May 25th, 1812.

PREFACE.

English Botany and British Mineralogy being now nearly finished, it is the desire of many, that those plants of ancient formation, which have been preserved in the rocks may be elucidated. I have long been attentive to the subject, and hope to indulge my friends and myself in a short time.

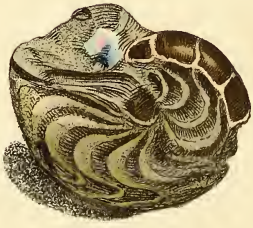
At present the digging for the Archway at Highgate, having led to many unexpected discoveries, and causing a still louder call for the Elucidation of the remains of Shells, I do not delay to publish them, especially as they greatly help to form a catalogue that includes many other habitats, even some foreign ones, so that when this work is complete, very little will remain to be done to include what are foreign, as one place will identify another through the whole known world.

The remains of Shells are sometimes so well preserved that many recent ones are not equal to them, either in preservation or beauty, and it often happens that the peculiar nature of their situation preserves them in a manner that excels all our art in representation. The pearly lustre is, in some, even superior to that of the most recent Shells, and the changes into Carbonate of Lime with the crystallized structure, into Flint, Calcedony, &c. are generally such as to excite our admiration; every minutia being so well cast as to preserve the most attenuated striæ or elaborate markings; and even the polish and colour are often admirably retained, and additional splendour gained under ground, by means of Sulphuret of Iron, giving a metallic lustre which equals, if it does not surpass every thing else.

It is thought that Generic names of Shells, without the termination *lites* or *ites*, to signify the stony substance of which they consist, as Nautilus, not Nautilites, are preferable, as it often happens that the slight change Shells have undergone may not warrant them, and the cast shewn may be considered quite inconsistent with such a term. The description will say in general what change a specimen may have

undergone, and the figures will be done in such a way as to help the description as much as may be, with the shining pearly stony or metallic brilliancy. Many species of one genus may be included in a plate, as it might be thought insignificant to figure a single small Shell alone. I have long since possessed a tolerable collection of British Fossil Shells. To the addition of a fine series from Highgate, by favour of my indefatigable friend B. G. Snow, Esq. may be attributed my more particular attention to this branch of Natural History. I here beg leave to thank him and other kind friends for the many specimens received, and hope the present undertaking will meet their approbation.

JAMES SOWERBY.



May 25 1812 published by J.& J. Sowerby London.

TAB. I.

NAUTILUS Imperialis.

GEN. CHAR. Shell univalve; divided into chambers by numerous transverse septæ, connected by a siphunculus or tube.

SPEC. CHAR. Involute, umbilicate; aperture lunate; septæ entire, concave, broadest in the middle, truncated and slightly recurved at their ends; siphunculus nearest to the inside.

THE axis of this species measures about two thirds of its greater diameter, and the septæ are about one eighth of their width distant from each other: the umbilicus is probably open, in which it differs from Nautilus Pompilius: the external coat is striated in the younger Shells and often of a light brown colour, under this the Shell is beautifully pearly; the inside also is pearly.

The upper figure shows a specimen from the great Clay stratum lately laid open at Highgate, and has some of the brownish outer coat remaining. It is broken at the mouth, which is closed by a pearly concave septa showing the aperture of the siphunculus, the other parts of the remains of the Shell are also pearly, and more or less iridescent. The broad undulations of the septæ are seen in one part separated by shining brown Carbonate of Lime bearing a slight resemblance to a Lobster's tail; in another part the chambers are opened, the first of which is lined with the yellowish more waxy Carbonate of Lime and shows part of the siphunculus. The other septæ are more or less broken, and show the chambers coated on the inside with brilliant variously coloured crystals of Pyrites, chiefly very small

cubo-octaëdrons. The left hand figure below is from a continuation of the same Clay formation near Minster, on the Isle of Sheepy, and is from the inside of one of the same species, appearing more perfect; it has, however, none of the epidermis, and the pearly lustre is almost lost in an opaque whiteness; it serves well to shew the contour of the Shell; the dotted outline underneath shows the form of a septa, and the situation of the siphunculus: the middle figure is part of the largest siphunculus I have ever met with. This Shell is often found of a considerable size at Sheepy, and, as Mr. Trimmer informs me, at Brentford; at Highgate large portions have been found, and I met with three pieces that nearly fit, and when put together indicate a proportion larger, I believe, than usual for this species, viz. 12 inches for the longest diameter, $7\frac{1}{2}$ inches for the axis, and 8 inches for the shorter diameter, making a fine specimen. The largest piece has retained most of its epidermis, of a brownish buff colour, elegantly netted with dull Pyrites formed in knots or drops; the rest of the Shell is variegated and pearly; and the last chamber, which is generally understood to be the habitation of the animal, is filled with marly Clay. I was about to give a folded outline of this in the work, but was persuaded to publish a full sized coloured figure, which I have done for the convenience of those who wish for such a representation.

It may be understood, that, in general, while a Shell retains a pearly lustre, there remains some of the animal gluten. I have a specimen of this Nautilus from Brentford, by favour of Dr. Sutton of Norwich, which has some of the cuticle or filmy skin of one of the septæ remaining quite elastic, partly covered with Pyrites. A specimen I have lately got from Highgate, besides Pyrites, contains fine spiculæ of Sulphate of Lime.

It may not be amiss here to observe, that the Highgate

Clay, and that of Sheepy, and several other places, are considered as detached portions of the highest known stratum but one, which is Sand. As it lays not far above the Chalk, it may be sought for in those districts which are bounded by Chalk, but as Mr. Farey has observed to me, in a valuable letter upon this subject, this "being the uppermost stratum but one, it is mostly denudated and gone; and, except in some particular tracts in and near where the Sand upon it is found, this blue Highgate Clay will be found only in particular hummocks or isolated patches on the Clays and Sands beneath it (in which the London wells are sunk)." Mr. Farey has also favoured me with a detail of the boundaries of the three great tracts on which the strata covering the Chalk are found; the Northernmost extending along the coast a considerable way on each side of the mouth of the Humber; the middle or greater tract covering the South of Norfolk, greater part of Suffolk, Essex, Middlesex, parts of Berkshire, and Wiltshire, the South of Hampshire, Surrey, and Kent; the Southern tract extends from Brighton to Axminster in Devonshire. It would be doing a service to Geology, if persons resident in these tracts would search for and compare the fossils with each other.

NAUTILUS centralis.—*Left hand figure.*

Spec. Char. Involute, umbilicate; aperture bluntly lunate, septæ entire, concave, not recurved at their ends; siphunculus central.

This Shell is about three-fourths of its diameter in thickness, and the concavity of the septæ is gentle and regular without recurving; see the outline below it. The distances of the

septæ are nearly the same as in the last, as I find from separated specimens which I possess. It appears to be a new species, and I have called it centralis because the siphunculus is central.

The specimen is from a well dug in Richmond Park, 175 feet deep in the great Clay formation. It is filled up with a dullish Pyrites, and the Shell is slightly pearly.

NAUTILUS ziczac.—*Lowest figure.*

Spec. Char. Involute, inner turns concealed, aperture bluntly triangular, septæ concave much recurved at their ends with a deep indenture in the edge on each side, siphunculus nearest to the inside.

It is about one third of its diameter in thickness, being a flattish Shell. The remarkable zigzag appearance of the septæ and their broad edges distinguish this Shell pretty readily from any I before knew, except a large one figured by Mr. Parkinson in his Organic Remains, vol. 3, tab. 7, fig. 15, and which may perhaps prove to be an older specimen of the same Shell, but the great indentation in the edge of each septæ is contracted towards the middle so as to become suddenly acute, and not turning regularly round as in this, but it must be remembered that the specimen he has figured is a cast, and not the Shell. My specimen is from Highgate, and is the only one I have met with.

May 25 1812 published as the Act by Jas. Sowerby London.

TAB. II.

AVICULA media.

GEN. CHAR. A free Shell, a little gaping near the beaks, fixing itself by a byssus, having valves of unequal size, the hinge linear, without a tooth, extended over the beaks into two wings. The Cartilage of the hinge oblong, broadest near the middle and marginal. Muscular impressions two, contiguous.

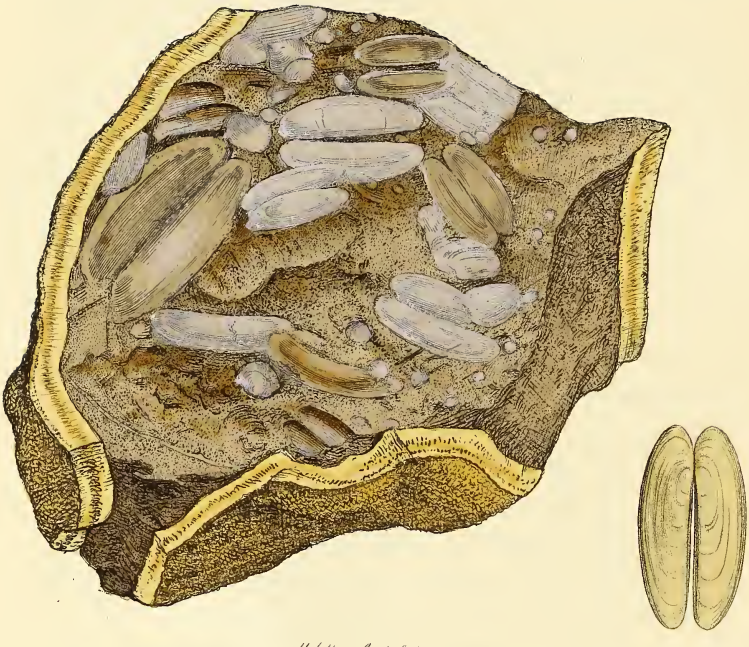
SPEC. CHAR. Ovate, depressed; wings large, unequal, one wing acute, valves nearly equal; length of the Shell and hinge nearly equal; surface smooth.

OUR Shell agrees sufficiently with the recent species of this genus to be ranked with them, and more correctly so than with those of any other genus. Its valves, however, appear to be nearly equal, and the hinge in the larger specimens shows some signs of a depression and tooth near the short wing, and a little elongated swelling on the opposite side, like Mytilus Hirundo Linn. We think also that there is some vestige of a constriction or fold around the short wing, that is most apparent in the large pearl muscle, Mytilus margaritiferus, Linn. Indeed it seems altogether very nearly allied to both of these, but is nevertheless a distinct species, the wings being shorter than in M. Hirundo, and longer than in M. margaritiferus. I therefore consider it as a species which comes between the two, and name it accordingly.

This species is from $\frac{1}{4}$ to $\frac{1}{2}$ an inch square, it has a brownish smooth epidermis, marked with distant concentric striæ, and is pearly within.

Many masses of these Shells have been found, each as big as a bushel or more, chiefly in a rotting state, in a mixed darkish Clay in different parts of Highgate Hill, but they are difficult to preserve.

The right hand lower figure shows a fine specimen on a piece of Septarium of hardish brown Marle, with some fragments more or less enveloped in it. The figure of the inside near it is as distinct as I could make it with the help of many specimens, which all have a pearly appearance and lustre, both inside and out, when the epidermis is decayed. The upper figure shows a specimen of the same stone in a state of decay, full of smaller Shells; the outside has become ochraceous, and the Shells more chalky; the inside being less changed is darker, and the remains of Shells more pearly. The two casts taken from within the Shells of this specimen (see the left hand figures) seem to show them to be nearly equivalved, but like the pectens, the principal parts may be rather equal, while the wings of each valve do not meet each other. I do not know that this Shell has been discovered any where besides at Highgate. I have to thank Mr. Snow for this, among his other numerous favours, so likely to become instructive to the public. I have specimens of Avicula Hirundo from Marazion, found by Miss Elizabeth Pocock, and minute specimens from Bantry Bay in Ireland, by the friendship of Mr. Drummond, but it is certainly another species. I mention these here to show that we have still on our coasts Some Shells nearly allied to the fossil ones, which have frequently been considered as related more immediately to those of the East Indies.



May 2.1812 published by Jas. Sowerby London

TAB. III.

SOLEN affinis.

GEN. CHAR. An equivalve, transversely elongated bivalve, gaping on each side, the hinge teeth, single in each valve or double in one valve.

SPEC. CHAR. Shell linear subarcuate, rounded at each extremity, hinge placed near one extremity, surface smooth.

THIS Shell is about five times as broad as it is long, but slightly curved and very thin.

It has been found plentifully imbedded in Marle septariæ at Highgate. Its similarity to Solen pellucidus, which has occasionally been found recent in several parts of England, is so great that we at first considered it as the same species, but in the fossil the extremity of each valve farthest from the hinge is uniformly rounded, which is not the case with the recent species, that being squarish at the end; this is, moreover, a rather straighter Shell. The teeth of the hinge could not be found in our specimens, but we suppose from the analogy of the greater part of the Shell, that they are like S. pellucidus. The sizes of both Shells vary, I have either from less than half an inch in breadth to above an inch, and of a proportionate length. They are of a darker or lighter horn colour. The fossil Shells are mostly placed in pairs.

Aug.1.1812 published by Jas. Howard London.

CYPRÆA.

GEN. CHAR. Shell univalve, ovate, convex, margins involute. Spire small, covered. Aperture longitudinal, narrow, toothed on both sides.

CYPRÆA oviformis.

TAB IV.

SPEC. CHAR. Egg shaped, tumid, smooth, slightly marginate; aperture widest at the lowest end, left side of the aperture obscurely toothed; right lip involute, tumid.

THE shell is most gibbous at about one-third of its length downwards, then tapering to a short beak, which forms a broadish canal; the aperture vertical, narrowest where the body of the shell is most gibbous, and much widest towards the beak, dentated on both sides. The whole shell smooth and shining, with the striæ of growth generally delicately marked in elegant curves round the beak; there are some longitudinal angles, scarcely perceptible, surrounding the most swelling parts; colour pale brown buff. It does not appear that this shell was known any where before the opening of the hill at Highgate, not even in Hampshire. Some specimens are so well preserved as to retain entire the external shining porcelain coat, which is so admirable in some recent shells of this Genus, but not the transparent epidermis, although it looks almost as if it were in some of these preserved specimens; this china-like polished surface seems to prevent parasitical shells or animals from adhering to it. This coat is often more beautiful in consequence of

external marks, but the present species is sufficiently preserved to show if there had been any. The upper shell has a little remains of the shining outside, the upper part is a little broken, the lower part or beak is very entire, and shows some of the teeth; it is filled with hardish marle, so as to hide the remainder of the teeth, which, however, are seen in the right hand figure of a smaller shell, which is finely preserved with the polished coat and a brown stain of Iron Pyrites, the beak is enveloped in Pyrites. The left hand figure is the dorsal view of the same shell. The lower figure is more injured, showing by the breaks in two or three places the dark Pyrites which fills the shells, and adheres over the cracks. I am obliged to the generous Mr. Weatherell, who discovered this shell at Highgate, for the specimens figured.

It is to be observed that accidentally the plate of these shells has been reversed in the engraving, bringing the mouths to the left instead of the right side.

May 1812 published by Jas. Sowerby London.

NATICA, *Lamarcke.*

GEN. CHAR. Univalve, nearly globose umbilicated shell; aperture entire, semi-orbicular; columella transverse, without teeth, externally callous, callosity contracting, and sometimes even covering the umbilicus.

NATICA glaucinoides.

TAB. V.—*Three upper figures.*

SPEC. CHAR. Nearly globose, spire rather elongated; umbilicus simple, partly covered; upper part of each whorle slightly depressed.

WHORLES about five, the breadth of the lowest volution three-fourths of the length of the shell, the upper part a little flattened or even concave, the remainder gibbous. Umbilicus large, sometimes with a little appendage from the lip, projecting more or less conspicuously over it, and forming either a transverse ridge dividing the umbilicus, or a callous tooth. Shell externally glossy, of a light brown colour with some indications of darker brown bands.

The remark, that fossil shells differ from the recent ones, is here curiously verified. This shell in its general appearance so much resembles Nerita glaucina, that without comparison it was considered as the same species, but on observing it with attention it will be found sufficiently distinct, the spire in this will be found to be higher, nearly in the proportion of one-fourth to one-fifth, than in N. Glaucina. N. Canrena is yet shorter. I have seen twenty or more specimens all alike. The inner or umbilical lip is

coarser, and more apt to pass into a callous tooth-like projection over the umbilicus. These are found abundantly in the dark clay at Highgate, from the size of the upper figure down to the size of a small pea, varying somewhat in the spreading of the pillar lip, and having sometimes the lines of growth more worn and distinct; the outer lip being thinner or thicker according to its state of maturity. The middle figure shews the left lip more spread, thinner, and partly worn away on the body of the shell, and the projection half covering the umbilicus. I have named it as above, from its resemblance to Nerita Glaucina. The cast is sometimes found in clay, coated with dark Pyrites, or hollow, lined with crystallized iridescent Pyrites.

NATICA similis.

TAB. V.—*Two middle figures.*

Spec. Char. Shell rather rhomboidal; spire short, umbilicus divided by a spiral projection, mouth slightly angular above.

Spire small, of three or four nearly flat volutions, giving a rhomboidal contour to the whole shell, the umbilicus double, or divided by a transverse spiral projection, terminating at the inner or left lip, forming an obtuse lobe, from which the lip afterwards spreads on the shell, and terminates abruptly against the curve of the upper part of the outer lip, a little like Nerita pallidula. I could not help being very much pleased with the extraordinary similitude of this specimen and a specimen of a recent shell, bearing the name of Nerita rufa, (see Mont. Test. Brit. Sup. tab. 30, p. 150) which it agrees with, excepting in colour and size, being smaller,

and the lobe not continuing the upper part of the outer lip: I have therefore designated it as a new and extraordinary species. It was found towards the surface of the Highgate clay stratum, where it is more or less mixed with the greenish sand. This shell bears some relation to N. epiglottina of Lamarcke, but differs in the general form, as well as in the form of the mouth and left lip, according to his figure. There being only these little distinctions between these species, I call this Natica similis. I have a cast about the size of the shell below, from Bognor, by favour of W. Borrer, Esq. that I judge indicates this species.

NATICA depressa.

TAB. V.—*Lower figures.*

Ampullaria depressa? Lamarcke, Ann. du Mus. t. 5, p. 32. t. 8, pl. 61, f. 3.

Spec. Char. Nearly globose, subumbilicated; upper part and side of each whorle flattened, so as to appear nearly square; columella depressed beneath; mouth angular at the upper part.

Spiral volutions about six, flattened above; the large lower whorle loses that flatness at the upper part of the mouth; the right lip is undulated by the lateral depression, which reaches to the middle of the lower volution, which then becomes convex. The mouth is most acute at the upper part; the inner or left lip spreading a little, nearly in a straight line, gives it an almost lunate form. Umbilicus oblong, not very deep.

I have this shell only by favour of the Rev. P. Lathbury, from Woodbridge, Suffolk. It is whitish and chalky.

May 1 1822 published by Jas. Sowerby London

CASSIS, *Lamarcke.*

GEN. CHAR. Shell univalve, ventricose, gibbous; aperture longitudinal subdentated, terminating in a short reflected canal. Columella plicated on the lower part, lip flattened and forming a ridge on the body of the shell.

CASSIS carinata.

TAB VI.—*Three upper figures.*

SPEC. CHAR. Shell pyriform; spire short; volutions depressed, angular, with many longitudinal striæ, and three nodose ridges; beak recurved.

SYN. Buccinum nodosum, *Soland. and Brand. Hantoniens.*

SPIRE short; rather acute; volutions six, angular, longitudinally striated, striæ rising, alternately large and small; mostly decussated with the striæ of growth. Three rows of prominences on the more gibbous part of the shell, the one at the edge of the depression most prominent, the other two concealed by each succeeding volution. Mouth oblong, a little contracted at the top by one or two tooth-like projections within the right lip, and two or three within the left lip; right lip reflected, broad, concave, retaining the striæ of the outside, joining the left lip at the top, which is also broad, plicated, and passes from the gibbous part of the shell over the umbilicus and the recurved beak.

This seems to be the shell figured in Brander's frontispiece. I received the specimens from Highgate, where several have been found in fine preservation. It is said to be found in

Arragon, and in the sandy hills of Tuscany. Thus we have something by which to make a comparison, as far as relates to similarity of formation. It is found either in the dark clay, or in the more sandy soil among it, at Highgate. The upper figures show the front and dorsal view of the shell. The middle figure is an internal cast, being yellowish Carbonate of Lime, showing the polished inside of the shell, which was filled with Indurated Clay and Pyrites; a little of the shell remains in a chalky state on some parts. It is always worth while attending to the casts of shells, as in some formations they only remain, and we may by practice learn to what shell they belong, which may prove abundantly useful. I have a small broken specimen, in which the inner lip is much spread, and having only one distinct row of projections on the edge of the more ventricose part, and the striæ are finer; perhaps it is a younger shell; it is filled with sandy clay. Also from Highgate.

CASSIS striata.

TAB. VI.—*Four lower figures.*

Spec. Char. Shell ovate; spire acute; volutions oval, longitudinally striated, with one obscure nodose ridge; beak nearly straight.

Spire short, rather acute, volutions about six, covered with rising longitudinal striæ, which are all equal, except one close to the upper edge, and one between that and the nodose ridge, which are more prominent. Lines of growth indistinct. Mouth oblong, right lip reflected, broad, flat, toothed within; left lip broad, plicate, passing over the umbilicus

and part of the beak, which is straight in the young shells, but slightly curved in the old ones.

This species, as well as the last, is found at Highgate, and I do not know that it occurs elsewhere. It differs from the last in being longer in proportion to its width, and more regular in its form; it has but one row of little projections on a less angular ridge, below which the shell is most gibbous. The striæ are mostly simple. The lips are nearly the same, but the right one is slighty toothed all along the inner edge; see the front and back views, right and left hand middle figures. The lower figures are from parts of larger and more mature shells, one showing the outer lip on the surface of the shell, which continues beyond it; thus it appears that this animal, like other shelly animals, may, after perfecting its shell, leave the former lip and continue its growth; it has some of the top of the newest lip left, joining the left lip, which is extravagantly spread over the body of the shell. The other figure is an amber coloured Carbonate of Lime cast of this species, it is distinguished from the cast of C. carinata by its regular surface wanting the nodose ridges.

These shells vary somewhat, so that some approach more than others to the last described. I am uncertain therefore whether it be correct to consider them as distinct species, and I am inclined to believe that Lamarcke supposes them to be only varieties. In either case the figures may prove useful.

Augs. as published by J.F. Swaby, London

MYTILUS.

Gen. Char. Bivalve longitudinal shell with an acute base; beaks straight, nearly acute, terminal; hinge mostly toothless.

MYTILUS amplus.

TAB. VII.

Spec. Char. Shell depressed, triangular, acute-angled at the base; longitudinally striated, excepting over the posterior side; thin.

Almost twice as long as broad, depressed, triangular, length of the two sides unequal, two of the angles rounded, the third at the base acute. Valves acutely convex towards the base, with a slight curve; striæ impressed, arising from the beaks, and proceeding with some undulations to the extremity of the shell. Posterior side straight, a little waved, free from striæ. The shell very thin, and composed of fibres perpendicular to its surface.

I am obliged to my kind friend, Thomas Meade, Esq. for procuring me this specimen from the Limestone quarry at Mitford. It is worthy of remark, that this shell at first sight resembles a Pinna, it does not, however, appear even to have been open at the extremity, or gaping at the upper part, as the Pinna is.

Aug.1 1823 published by J.C. Sowerby London.

MODIOLA.

Gen. Char. Bivalve nearly transverse, equilateral shell; posterior side very short, beaks lying towards the short side; hinge without teeth; a marginal linear groove to which the cartilage is fixed; only one muscular impression.

MODIOLA depressa.

TAB. VIII.—*Three upper figures.*

Spec. Char. Much depressed, ovate, narrowing towards the posterior side; surface smooth.

This shell is about $2\frac{1}{2}$ times as broad as it is long, and thin, the margin even and very regularly curved, it is altogether very flat, but particularly so at the anterior side; the beaks are very slightly prominent, and are rounded. Lines of growth faint. External coat shining, pellucid, internal pearly.

This is not very rare at Highgate in the nodules of Septarium, at nearly the top of the great clay stratum, or in the clay itself, but then difficult to preserve, being so extremely tender, that, as the clay shrinks in drying, the shells crack and scale off in pieces, else the appearance of an epidermis is almost to be recognized. The pearly iridescent lustre of the inner coat inspires the finder with ecstacy, on account of the riches in his possession, which are perhaps to be preserved only for a few hours. The upper figure is from a specimen on a rather hard sandy piece of a Septarium, on the under side of which are a pair of Solen affinis. In the specimen below, taken out of the clay, the outer coat is preserved. The small specimen in the middle of the plate is from a Septarium found near Whitby, it is much thickened by fibrous Carbonate of Lime.

MODIOLA pallida.

TAB. VIII.—*Three right hand lower figures.*

Spec. Char. Oblong, gibbous, smooth, inferior margin straight, posterior side slightly swelled, beaks obtuse.

Breadth above twice its length, bluntish at the beak, and rounding at the other end with an angular turn towards the hinge; striæ of growth distinct; shell a little glossy.

I am indebted to our indefatigable friend, A. B. Lambert, Esq. for specimens of this in flinty Chert, found at Fonthill, adjoining the Limestone quarries, where many shells are partly dissolved as it were in Flint, Hornstone, or Calcedony. This shell, as well as most others, among which are Ammonites, Tellens, &c. are rather Calcedony.

MODIOLA lævis.

TAB. VIII.—*Left hand lower figure.*

Spec. Char. Subtriangular, very smooth, convex, inferior and posterior margins nearly straight, united by a short curve; beaks small.

Breadth rather less than twice its length, very smooth, scarcely showing the lines of growth, inferior margin nearly equal to the anterior margin, posterior side protuberating a little, anterior side rather depressed.

A little congregation of these are on a piece of foetid Limestone, or Swinestone, of some Authors, sent me by Miss E. Hill, who gathered it the ruins of Cærphilly Castle, Glamorganshire. With it I received this remark, that "this Castle was built by Robert Fitz-hammon, in the year 1110, and the stones of Barry Island have the same shell in much the same state, and consequently no visible change has taken place in 702 years."

Aug 1 1831 Published by J.C. Sowerby London

MODIOLA parallella.

TAB. IX.—*Upper right hand figure.*

SPEC. CHAR. Shell transverse, anterior and posterior sides parallel; covered with transverse furrows.

NEARLY twice as broad as long; acutely convex; beaks rather sharp; transverse furrows or striæ few, diverging from the beak; inferior margin straight, short, and almost at right angles with the sides, which are nearly straight and parallel.

I found this in a quarry near Maidstone; it is in a darkish Limestone which may perhaps be compared to the Blue Lyas of Bath; it is only the impression of the outside. I have met with no other specimen of this species.

MODIOLA elegans.

TAB. IX.—*Left hand upper figure, middle figure, and lower figures.*

SPEC. CHAR. Oblong, gibbous, inferior margin straight, dentated; anterior side covered with transverse furrows; posterior side swelling, smooth, with a few transverse furrows near the base.

GENERALLY about twice as long as broad, moderately convex, beak a little curved; striæ neat, close, a little undulating, passing from the beak over the most prominent part of the shell, and diverging over the anterior side to the

base, and half way over the posterior side, when they become obsolete, but appear again close to the beak; the inferior edge is serrated so as to resemble an Arca.* The superior margin is semicircular. The coat looks like an epidermis; the inner coat is often richly pearly and iridescent.

Highgate has produced this species in great abundance, in very large clusters much crowded and jumbled together, from half an inch to two inches in breadth. They are very apt to scale into laminæ coat after coat, till the surface is altogether pearly. I had a fine specimen found about 300 feet deep in the clay bed in Richmond Park, but the clay which I dried very carefully, yet shrunk from the shell, so that only the impression remains.

Bognor, in Sussex, affords this shell, I believe, but rarely, the specimen figured at the bottom of the plate is perhaps distorted by some accident; if not, it might be distinguished by its peculiar contour, as it is somewhat thicker than wide, with the posterior side depressed, which gives it a bow-like curvature. I had this specimen by favour of a great friend to the science, W. Boys, Esq. F. L. S.

* In Mytilus Bidens, which this shell much resembles, the serratures on the hinge are very prominent, and pass all round the edge of the shell, and are distinctly marked at the beak. Ours appears also to have hinge teeth at the beak.

Oct.1 1812 published by Jas. Sowerby London.

HELICINA, *Lamarck.*

Gen. Char. Shell subglobose, without an umbilicus; Aperture entire, semi-ovate; Columella callous, flattened at the lower part.

HELICINA compressa.

TAB. X.—*Three middle figures.*

Spec. Char. Spire flattish, an elevated thread surrounding the upper part; Mouth a little angular above.

Diameter about half an inch, height about one-third of an inch, shell very thick and strong.

I was favoured with this specimen from Leicestershire, by Mr. Milne, F.L.S. it is in a dark coloured Limestone, and has the outside of the shell very perfect; the callous columella taking place, as it were, of the umbilicus, is very curious, and remarkably well preserved for a shell which is so completely mineralized. I am not sure that this will quite agree with Lamarck's Genus Helicina, and indeed he himself seems very doubtful whether the species he has given, and calls dubia, really belongs to it.

HELIX.

Gen. Char. Shell globular or orbicular, with a convex or conoidal spire; Aperture entire, wider than long, diminished in its upper part, by the projection of the last turn but one of the spire. A small spiral umbilicus runs nearly through it.

HELIX carinatus.

TAB. X.—*Upper and lower figures.*

Spec. Char. Spire short, conoidal, of three or four turns; a raised, flat, ribband-like projection passes from the lateral edge of the mouth along the middle of the last turn, till it meets the inner edge of the mouth, whence it continues between the volutions to the end. Umbilicus open.

Greatest diameter nearly two inches, length about one inch and an half. Upper part of the whorles, as well as the ribband-like projection, transversely striated.

I was favoured with this specimen from near Settle in Yorkshire, by Mr. Ducket; it is in solid grey Limestone; the inside cast is distinct in some parts where the shell appears to have been broken. That part of the shell which remains, is now nearly transparent Carbonate of Lime. I expect this is not common, as I have never seen it in any other collection.

SOLARIUM.

GEN. CHAR. Shell univalve, depressed, conical, nearly discoidal, umbilicated; Umbilicus spreading, crenulated or denticulated at the margin of the volutions: Aperture approaching to quadrangular. Axis oblique.

SOLARIUM patulum.

TAB. XI.—*The lower right hand figures.*

SPEC. CHAR. Depressed; whorles smoothish, margins keeled and crenulated; Umbilicus spreading; margin of the umbilicus strongly denticulated.

Lamarck *Ann. du Mus.* 4. 53. and 8. *Tab.* 35. *f.* 3.

DIAMETER from three-eighths to three-fourths of an inch. Length nearly half its width. The umbilicus is curiously and beautifully ornamented with a crenulated border, surrounded by a row or two of small denticulæ. The flattish disk-like surface swelling a little, has longitudinal striæ with more or less fine transverse marks over it. The outer angle of the shell is sharpest, the upper surface of the edge is milled, as it were, with oblique transverse striæ causing small oblong risings like the oblique milled edges of Guineas. The shell is also longitudinally striated beneath.

Found rather abundantly in the dark clay stratum at Highgate. It approaches very much to Brander's tab. 1. fig. 7 and 8. but is nevertheless distinct; it may be considered cotemporary with the Hampshire fossils.

TAB. XI.—*Left hand lower figure.*

THIS specimen is from Highgate. It appears to be an old specimen of the last species, in which the crenulations of the umbilicus, and the milling of the upper edge, are become nearly obsolete. The shell itself is in a very decayed state, but in those parts of the umbilicus where any of the shell remains, the crenulations have the appearance of ragged transverse wrinkles, except at the inner part of the umbilicus, where they resemble those of the last.

TAB. XI.—*Left hand upper figure.*

THIS is also from Highgate, it appears to be the cast of the inside of Solarium patulum, but is larger than usual, and there is some doubt if it be not the inner cast of a new species. It is however remarkable, and worthy of a figure,

being so very perfect and large ; besides it becomes instructive as it much resembles, and has been taken for a serpula.

SOLARIUM discoideum.

TAB. XI.—*Upper right hand figures.*

Spec. Char. Discoid, outer edge sharply carinated ; edge of the umbilicus rounded, transversely wrinkled ; aperture obliquely elliptical, pointed at each end.

At first sight, the discoid appearance of this shell, when the spire is downwards, is perhaps sufficient to distinguish it. It is a remarkably neat shell. The outer margin on the under side is remarkably plain and almost longitudinally canaliculated. The outer edge is very acute. The upper side has a broadish margin, rather irregularly and obliquely striated transversely, and a little undulated, which is scarcely continued up the spire. The spire has six or seven whorles, and the whole though broadish is rather acuminated at the apex. The mouth has a long rhomboidal appearance, the outer edge being most acute.

This shell, which is remarkably well preserved, was found in Barton Cliff, Hampshire, by the Rev. F. Iremonger, by whom it was presented to me.

SOLARIUM conoideum.

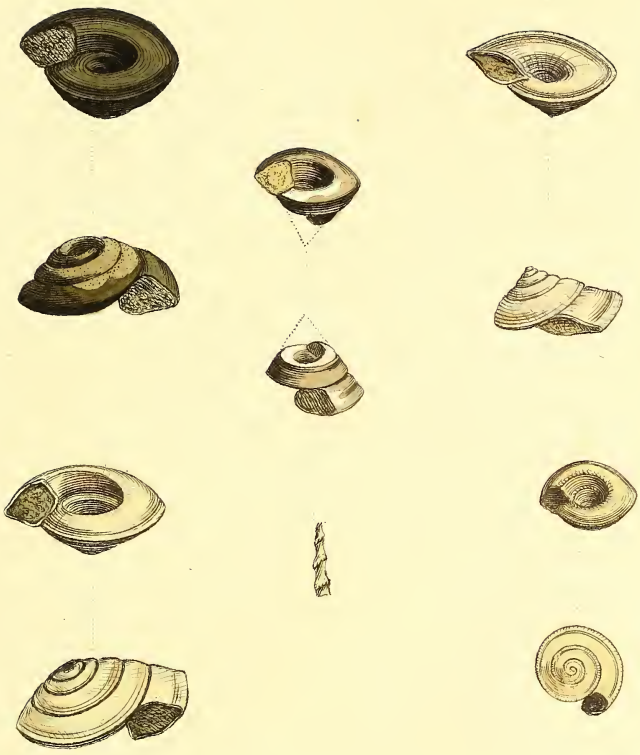
TAB. XI.—*Three middle figures.*

Spec. Char. Conical, smooth; Aperture quadrangular; Umbilicus deep, narrow.

This has apparently an almost square aperture, it is a higher cone than the former ones, and the middle of the volutions are a little depressed, otherwise it is exceedingly plain and smooth.

Sent me from Portland several years since by Mr. Bryer, whose loss I always regret when his favours come to hand. On account of its peculiar characters, I think it claims a place here.

The shell is almost worn away, and is chalky ; the cast of the umbilicus is figured at the bottom, which shows that the inner spiral edges were crenated ; this also indicates the height of the shell.



Otis was published by Jas Sowerby London.

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AMMONITES.

GEN. CHAR. Volute, chambered, siphuncled, septa of the chambers undulated at their margins.

AMMONITES discus.

TAB. XII.

SPEC. CHAR. Discoid, outer edge acuminated; Aperture sagittate, half the diameter of the shell in length, and one sixth in breadth. Volutions concealing each other.

SHELL apparently smooth on the outer surface, very much flattened and acuminated on the outer edge. Aperture spear-head shaped. Septa of the chambers irregularly undulated. About four inches in diameter, half an inch in thickness.

This specimen is from the stone quarry near the house of industry at Bedford; it is in the cabinet of the Rev. T. O. Marsh, who has favoured me with the loan of it. It is a rarity, and as far as I know, a new species. The umbilicus is probably covered, which seldom happens with an Ammonites; we see it on one side so nearly covered, although on the other it is less so, that we conclude it would be wholly covered in more perfect specimens. The septa show on one side their waved margins at different corroded depths in the shell, which is more than can be seen in more perfect specimens, and it is agreeable to learn by what is left us to distinguish species. A good Naturalist will know, sometimes, by a part the nature of the whole, in subjects of

this kind. We may perchance meet with better and better specimens, but often a mere memorandum is all that may be found for ages, and such will frequently serve as a geological identification of strata, which is often very convenient, and it will be highly desirable that those who meet with these or common subjects, will notice them wherever they be, that the Author or others may be able to point out every place of their occurrence.

Oct.1 1812 published by Jas. Sowerby London.

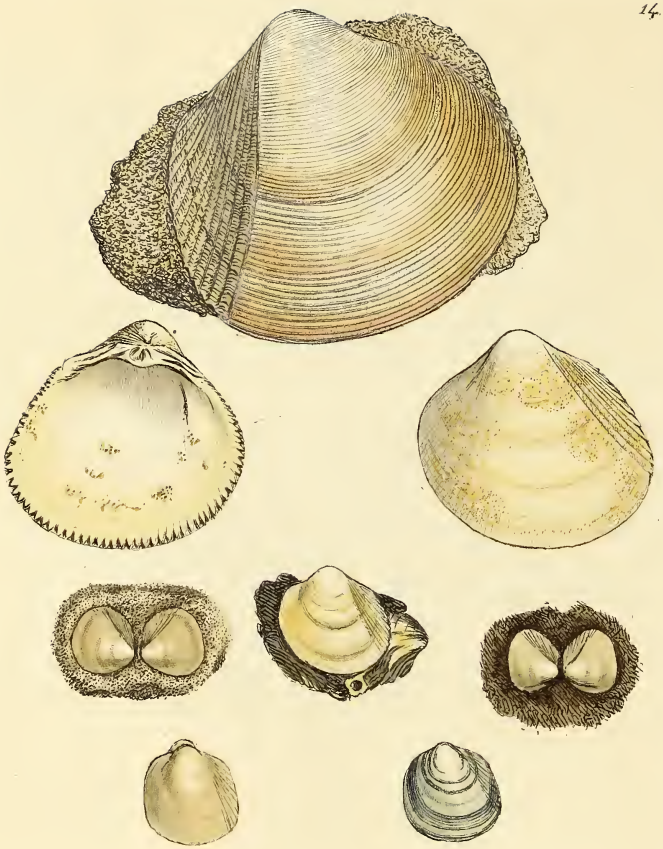
NAUTILUS discus.

TAB. XIII.

Spec. Char. Depressed, edge flat, aperture oblong, volutions not concealed by each other.

About four inches in diameter; greatest thickness or width of the aperture half an inch. Turns of the spire about five. Chambers very numerous. Septa distant from each other about one eighth of an inch. Outer edge of the aperture narrower than the inner one, notched, owing to a small groove which runs round the outer edge of the shell. Siphunculus nearer to the inner edge of the septa.

This specimen was found in the dark Limestone formation near Kendal, and was actually sent me as a petrified sheep's horn. Unfortunately the outer part of the shell, or as it was called the horn, was lost. As I had not any specimen resembling this in my collection, I considered it as rare. In the early part of this work, we shall not be able to distinguish rarities or localities so well as might be expected: that deficiency, however, now Geology is so much attended to, will be supplied as we advance.



Oct. 1 as published by Jas. Sowerby London.

CARDIUM.

GEN. CHAR. Shell an equivalved bivalve, subcordate; valves dentated on their inner margins; hinge with central and lateral teeth, the two central ones oblique, approximating; those in each valve crucially receiving each other by mutual insertion; lateral ones remote and inserted.

CARDIUM Hillanum.

TAB. XIV.—*Upper figure.*

SPEC. CHAR. Shell nearly circular, a little oblique, covered with numerous concentric striæ, anterior part straightish at the edge, longitudinally furrowed.

THIS species is rather wider than long, it is a little gibbous; the rising spaces between the striæ are smooth, giving a peculiar neatness to the shell: the longitudinal furrows occupy about one fourth of its breadth.

A remarkably elegant species, with fine specimens, of which I have been favoured by Miss E. Hill, of Tawstock, a Lady well known for her great attention to Fuci, &c. who desirous of seeing every thing figured from as good specimens as possible, presented me with her very best. Finding Mr. Parkinson at a loss for a name, and that the shell was sufficiently distinct from Cardium discors of Lamarck, I call it Hillanum thinking Miss Hill's attention and assiduity highly deserves to be remembered. The shells are siliceous, and are from the remarkable micaceous Sandstone stratum at Blackdown, near Cullumpton, Devonshire, a place rich in such curious productions, as will occasionally be shewn.

CARDIUM Plumstedianum.

TAB. XIV.—*Right and left hand upper figures.*

SPEC. CHAR. Subcordate, smooth; anterior part longitudinally furrowed.

IT has so much of the outer contour of the shell above, that it has been doubted whether they may not be the same species, the outside, however, does not seem at any time to have had the rising concentric lines, only the irregular and less distinct striæ of growth; and the lateral longitudinal pleated furrows cover but one fifth of the surface, and are terminated at the edge of the shell by longer and sharper serratures. The serratures round the other parts of the shell are not seen from the outside.

This is a rare species, but I was so lucky some time since, as to procure the specimens figured, and some smaller ones. It is fortunate when the inside of the shell is understood perfectly, on account of its preventing doubt as to the genus to which it belongs. The specimens are found in a loose mixture of sand, fragments of shells and gravel, above a stratum of gravel and covered by several layers of different sized gravel, one or two of which have such large pebbles, that they must have been laying very quiet when they were deposited, or they would have been inevitably crushed to pieces. The texture of shells found in gravel or clay is extremely delicate, and will scarcely allow the handling of them, indeed the contrast of a warm hand has made some specimens fall to pieces. Some of my friends soak them in Linseed oil to strengthen them, which protects them when dry, but gives them a disagreeable odour. I should imagine that to impregnate them with a little gum water would in most instances be pleasanter.

TAB. XIV.—*Middle figure*

represents a Cardium, of which I have many specimens, found in large masses of hard marle, near Bury St. Edmund's, which marle is replete with the Serpulæ with a sharp quadrate shell and round aperture. It resembles the upper one, but the concentric prominent striæ are wanting; and approaches nearer to the Plumstedianum, except in the breadth of the space covered by longitudinal striæ which continues further in proportion.

CARDIUM nitens.

TAB. XIV.—*Lower right hand figure.*

Spec. Char. Roundish, hinge end rather shouldered; smooth, shining; marked all over with faintish longitudinal punctated lines, which are rather more distinct at the anterior side.

Generally from one fourth to one half an inch in length as well as breadth; each shell nearly round, the end at which the hinge is situated is rather square, owing to a straightness of that end of the shell. Lines of growth indistinct, sometimes rendered visible by marks of a darker colour than the rest of the shells. It is most commonly white, but is rather variable, sometimes plain, but generally beautifully zoned with a dark bluish tinge.

This species is found abundantly at Highgate, and occasionally the specimens are not difficult to detach from the dark clay or marle which has envelloped them and preserved them so perfectly, that they resemble recent shells. They are conspicuous for their dark blue-grey concentric

striæ of different widths, relieved by a more or less beautiful nearly white china-like ground. The insides are all so lined with marle or crystallized Carbonate of Lime, that the teeth of the hinge cannot be seen.

TAB. XIV.—*Left hand middle figure.*

This much resembles the last, and is probably only a variety of it, but it differs in being apparently quite smooth, to the unassisted eye, it is however striated ; there are a few broadish concentric lines of a light brown colour on the shell, which is otherwise almost white ; it is rather a gibbous shell. The pair figured were found exposed on a darkish brown marly piece of Septarium from the Highgate Clay stratum.

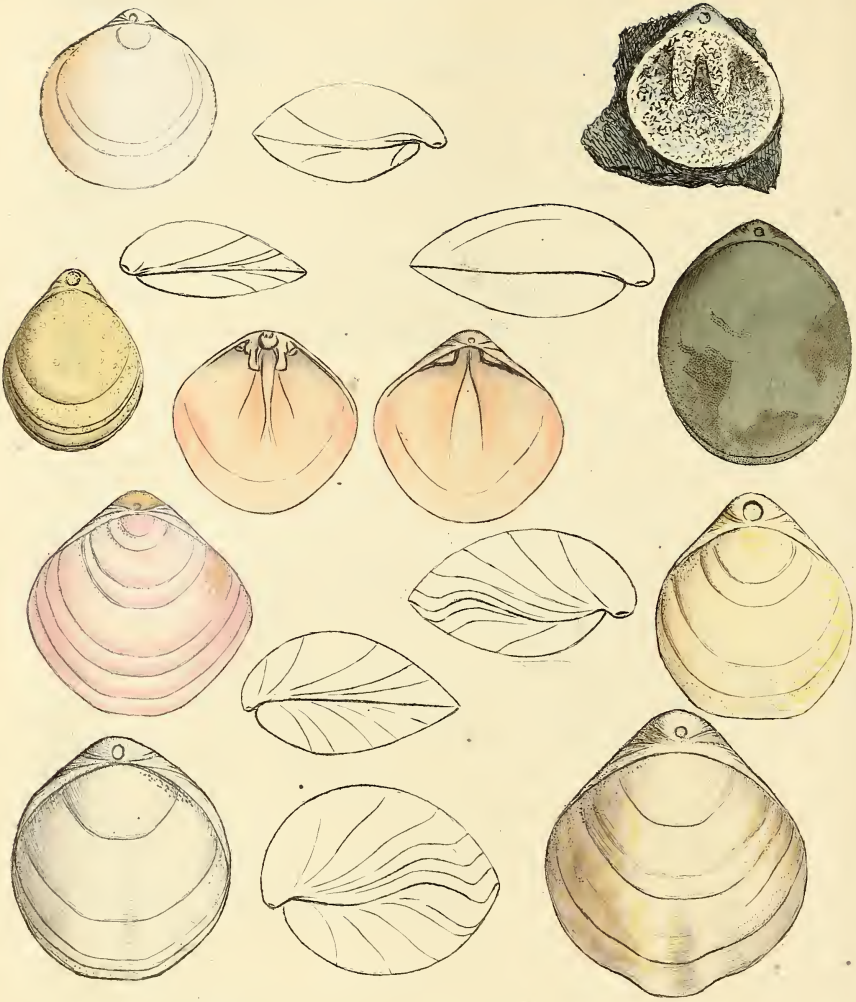
TAB. XIV.—*Right hand middle figure*

much resembles the last, but is smoother on the most prominent part of the shell, and does not shine so brightly: it is rather flatter, and nearly of an uniform light brown colour. This is in a more sandy Septarium from Highgate.

TAB. XIV.—*Left hand lower figure.*

The only material difference between this and the three foregoing, is its more rhomboidal appearance, though it is proportionally rather longer. It is rather paler in colour than the last. Also from Highgate.

The four specimens last described are probably only varieties of each other; I have, however, met with some who consider them as distinct species.



Peters published by Jas Sowerby London

TEREBRATULA.

ANOMIA Linn.

GEN. CHAR. Shell an equal sided inequivalved bivalve; beak of the largest valve prominent, perforated; a pair of curved surfaces on each side the beak, and two shelly elongated appendages form the hinge.

TEREBRATULA subrotunda.

TAB. XV.—*F.* 1 *and* 2.

SPEC. CHAR. Circular, depressed, smooth; valves regularly and equally convex; beak short.

LENGTH three-fourths of an inch, rather wider than long; slightly angular on each side the beak; the larger valve in some specimens a little deeper than the other.

Found in the hardish Chalk about Hornisham in Wiltshire, where they are often preserved of a beautifully silky lustre. The shells are scaly, and seem but little altered. My friend Mr. Meade has sent me specimens an inch and a quarter long from Cornbrach, inclining to a reddish colour, seemingly but very little altered, which may be a variety of this, but the perforated beak is more protruded, and the contour rather inclining to squarish. They were found in a soil partaking of Limestone with Ochraceous Iron. Dr. Sutton has sent me specimens from Suffolk: Lady Aylesford kindly forwarded some to me from a Limestone quarry near Warwick, with curious crystals of pellucid Carbonate of Lime covering the horn-like appendages of the hinge, and lining the shell, see f. 2. It is abundant in many places.

TEREBRATULA ovata.

TAB. XV.—*F.* 3.

SPEC. CHAR. Ovate or oblong-ovate, depressed, smooth; small valve flattish, slightly pentangular.

SAME size as the last, but longer than wide; the beak being protruded gives it an ovate form.

Chute, near Heytesbury, in Wiltshire, to which place I was conducted by the family of my late worthy friend, Mr. Cunnington, affords a most curious variety of extraneous fossils, mostly agatized, among which this shell is found. Some parts of the shell are whiter than others, owing to a little Carbonate of Lime. The rings of Vermicular shells are conspicuous, as is frequent with agatized or siliceous shells found in green sand. The spot where these shells are found is not above half an acre square, and after plowing, it is astonishing what an abundance of organic remains appear, as if some great Cabinet had been thrown away there, with some perfect, some mutilated, and some obscure subjects. I was so engaged an hour there, that I used all the time I had to find what I could, promising to notice the surrounding country another time.

TEREBRATULA punctata.

TAB. XV.—*F.* 4.

SPEC. CHAR. Oblong, depressed; valves equally convex, edge straightened at the front: the whole surface finely punctated.

LENGTH one inch and a quarter; width one inch. The very minute punctums are arranged in undulating lines, these, although to be found in most of the smoother species under the usual coat, are most conspicuous on the surface in this.

Abundant in the same dark Limestone, sent me by Lady Aylesford, with No. 2, at a place called Hornton stone quarry; they are sometimes sattiny, and white externally, and sometimes of a dusky brown, enclosed in Limestone of

the same colour; within the shell is white pellucid Carbonate of Lime, beautifully crystallized in primitive rhombs, and several varieties with truncations, bevillings, &c. and sometimes of a pretty pink colour, sometimes yellowish with spots of Oxide of Iron and Manganese; some rounding, not unlike B. M. Tab. 436 & 437, and these line the shell and cover the corneous processes, very elegantly pointing them out. Some Sulphuret of Zinc or Blende was in the Limestone with them.

TEREBRATULA carnea.
TAB. XV.—*F.* 5 *and* 6.

Spec. Char. Depressed, smooth, obtusely five sided, front edge short, valves equally convex, slightly flattened along the middle.

An inch or more in length, and the same in width; often of a dull red colour, the margin is not undulated as in the next species.

The soft Chalk of Trowse, near Norwich, affords the most perfect specimens of this species, which seem so little altered, that they look almost as if some one had contrived to gather them fresh, and after taking out the animal, had buried them in the soft Chalk, which had afterwards hardened a little. They are remarkable for being of a fleshy red colour. Being enabled to empty the shell, I have an opportunity of showing the inside with the curious hinge and appendages, f. 6. I have received similar shells from the softish Chalk near Warminster, as well as from Devizes, by favour of Mr. Salmon. Darker varieties were found about Coteswold, Gloucestershire, by Mr. Richard Taylor, jun.

TEREBRATULA subundata.
TAB. XV.—*F.* 7.

Spec. Char. Nearly circular, depressed, smooth, valves equally gibbous, front margin straight or slightly depressed in the middle, with one undulation on each side of it.

Length about one inch, rather longer than wide, front margin but slightly undulated; the surface more uniformly convex than in the last.

These are found in the softish Chalk at Warminster, and are sometimes of a fleshy red colour, like those found near St. Giles's Gates, Norwich, but differ in the roundness and undulations; perhaps among a great many specimens they might be found passing into each other. I could not get any one to show the inside.

TEREBRATULA intermedia.
TAB. XV.—*F.* 8.

SPEC. CHAR. Obscurely five sided, rather depressed smooth, larger valve most convex, front margin undulated; three depressions in the smaller valve, and two in the larger.

AN inch and half in diameter, the moderately deep undulations extend half way along the shells, the remainder of the valves are regularly convex.

This species, from Cornbrach, was sent me by Thos. Meade, Esq. The circles of growth indicate a nearly straight truncation in the front, when very young, but it is distinctly undulated when full grown. It is commonly of a reddish brown colour.

I have the same from Felmersham near Bedford, through the kindness of the Rev. T. O. Marsh.

TEREBRATULA semiglobosa.
TAB. XV.—*F.* 9.

SPEC. CHAR. Nearly circular, gibbous, smooth; largest valve deepest and uniformly gibbous, front margin undulated, with two risings in the smaller valve.

ABOUT one inch long, width nearly as much. It is so gibbous as to be sometimes as deep as long. The undulation is remarkably conspicuous in a side or front view, though scarcely perceptible if viewed from the top or underside, which the outline explains.

These shells are from the harder Chalk near Warminster. They are generally filled or lined with very clear Quartz, and sometimes the outer part or shell is partly Quartz, and partly Chalk. Mr. Cunnington is the friend to whom I am indebted for them.

SCALARIA.

Gen. Char. An univalve turreted shell, with sharp longitudinal raised ribs. Aperture nearly circular, with an uninterrupted bordered and reflected margin.

SCALARIA similis.

TAB. XVI.—*Two upper figures.*

Spec. Char. Whorles contiguous, spire with five or six rounded transverse elevations, close to each other, and somewhat decussated, the lowest most prominent. Ribs distant, circular.

Length an inch and an half, greatest width about half an inch. Volutions about seven.

I received the first specimen of this shell from Bramerton, near Norwich, a few years since; in 1812, Mrs. Cobbold favoured me with the same species found by herself at Holywells, near Ipswich. I do not know that more than one or two, nearly perfect specimens, have been found, neither have I learnt that it has been met with elsewhere. It is so like the Turbo clathrus of Linnæus (now Scalaria of Lamarck), that we have but one strong character to distinguish it by, the round transverse elevations. The specimens are generally so brittle, that they are apt to fall to pieces by being moved from a moderate temperature into an hand a little warmer, when they usually separate at one of the ribs, so neatly as not to spoil the contour of the shell, as they only appear smaller in proportion to the number of ribs separated. I call it similis from its resemblance to the Linnæan species, and one figured in the Annales du museum, which is there called Scalaria decussata, the mouth of which is, however, drawn much smaller, though this may possibly be some mistake of the draughtsman or engraver.

SCALARIA semicostata.

TAB. XVI.—*Middle figure.*

SPEC. CHAR. Volutions contiguous, spire transversely striated, ribs numerous, but slightly raised, lower part of each volution smooth, naked.

LENGTH half an inch, greatest width three-sixteenths. The ribs scarcely cover two-thirds of each volution. Volutions about seven.

This pretty specimen was among some of the earth accompanying other shells from Barton Cliff, kindly sent me by the Rev. W. Bingley. I have hitherto seen only this one specimen. The transverse ribs terminate rather abruptly a little above the mouth, nearly where there generally is a prominent line in some of the species, especially in the next.

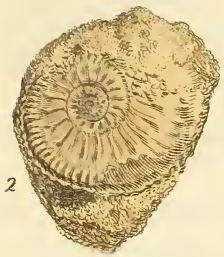
SCALARIA acuta.

TAB. XVI.—*Two lower figures.*

SPEC. CHAR. Volutions rather distant; spire with three slight transverse risings, and a fourth very prominent one, near the lower part of each turn. Ribs recurved, expanded, and acutely angular at their upper ends.

LENGTH eight-tenths of an inch, width four-tenths. Volutions about seven. The reflected margin of the mouth is extended at the upper part into a kind of short flat spine; the ribs unite the volutions to each other, and form a flattish space on their upper part. I am glad to present another extraordinary novelty and rarity, by favour of Miss E. Bennet, whom I have before mentioned. It is quite a new Scalaria from Barton Cliff. That Nature is ever treating us with variety and beauty is admirably exemplified in this production. The ribs and lowest transverse risings particularly distinguish it by their forms, giving a new contour to the whole.

I have observed another larger specimen of this beautiful and singular shell in Mr. Bullock's Museum, and there is a smaller one in Miss Bennet's collection.



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M.ª Lowe published by Jn.º

AMMONITES acutus.

TAB. XVII.—*Fig.* 1.

SPEC. CHAR. Involute, rather depressed, inner turns half exposed, surface with straight projecting radii extending over the interior half of each whorle; margin crenated. Aperture triangularly cordate, two-fifths of the diameter of the shell in length. Volutions three or four.

SHELL about one inch in diameter, and one-third of an inch thick, slightly carinated, flattish at the edge, with about three crenatures to each of the radii.

This is from the cliff near Minster on the Isle of Sheepy, it is a cast in blackish Pyrites, but after some years has luckily not begun to decompose, and still looks neat and elegant. On some parts the calcareous shell remains of a dull brown colour. The mouth is filled with little tuberose accretions of Pyrites, giving it the appearance of the mouth of a cornucopia.

AMMONITES cordatus.

TAB. XVII.—*Figures 2 and 4.*

SPEC. CHAR. Involute, rather depressed, carinated, inner turns half exposed; surface with angular, projecting, undulating radii, extending over the inner half of each whorle, the remaining half covered by diverging undulations terminating in a crenated margin. Aperture cordate, two-fifths of the diameter of the shell long. Volutions four or five.

FROM one to two inches in diameter, and about one-third of its diameter in thickness; generally about five external undulations to two radii; no depression upon the edge.

The specimen, figure 2, shows the exterior surface of the

shell; on it the radii are nearly equal in their thickness throughout, the external undulations are very prominent at their commencement, and the keel projects but little, hence the whole has a flatter aspect than No. 4. I gathered it myself in the better light coloured Limestone of Shotover in Oxfordshire, about the year 1805. It is often found larger, but seldom so perfect.

No. 4 represents a cast of the interior, the radii terminate with an acute prominence, from which they sometimes branch into the external undulations, these are not so prominent as in No. 2. The margin or keel is also broader and thinner than that of No. 2, its general contour is more uneven, and its sides appear more concave. I am much inclined to consider it as a distinct species. The specimen is a fine and instructive one, showing at the broad end the construction of the septa in an handsome manner, with the undulating and branching articulations which often give elegance to a specimen. This specimen is covered on the external part by an ochraceous Iron: the inside is light coloured Carbonate of Lime crystallized. It was sent me from Somersetshire by the late Mr. Cunnington.

AMMONITES quadratus.

TAB. XVII.—*Fig.* 3.

Spec. Char. Involute, rather depressed, carinated, inner whorles half concealed; surface with projecting furcate undulating radii entending into a crenated margin. Aperture obtusely square, in length about one-third the diameter of the shell. Volutions four or five.

An inch and an half in diameter, and less than half an inch thick, the radiating undulations are nearly regular in their thickness, they are forked about the middle of the whorle, where some short intermediate undulations commence without any regularity: the margin is not flattened.

Robert Sparrow, Esq. of Worlingham Hall, Suffolk, kindly lent me this specimen; it is an hollow chambered cast in semitransparent Calcedony. It was found in a gravel pit at Brandestone, near Framlingham, Suffolk, in 1781.

1.

2.

3.

4.

5.

6.

7.

April 1813 published by Jas Sowerby London.

SCAPHITES.

Gen. Char. A concamerated shell, commencing with a depressed volution, the last turn of which, after being enlarged and elongated, is diminished and reflected inwards.

SCAPHITES equalis.

TAB. XVIII.—*Figures* 1, 2, *and* 3.

Spec. Char. Involute, umbilicated, inner whorles concealed, surface with projecting distant radii extending all round the whorle; outer part rounded with about two projecting striæ between and equal to each of the radii; outer whorle ventricose, the radii upon it much enlarged, and abruptly terminated before they reach the edge.

This is an even shell, a little more than an inch long. On account of the imperfection of the specimen, I am not sure that the mouth is incurved.

I received this specimen some years ago, by favour of the indefatigable and highly intelligent Dr. W. E. Leach, from Yeovil. I place it under Mr. Parkinson's new genus Scaphites, not with the strictest propriety, but in the present infant state of our knowledge, it may be convenient, as it agrees so nearly with the next. Figure 1, is a side view. Figure 2, shews the front with the volution central and a flinty grain or two of sand. Figure 3, is a section through one of the concamerations, exposing part of the undulations, not always to be seen in such marly stone casts. The coat or remaining part of the shell has a little of the pearly lustre. It is from the green sand formation.

SCAPHITES obliquus.

TAB. XVIII.—*Figures* 4, 5, 6, *and* 7.

Spec. Char. Obliquely involute, umbilicated, inner whorles concealed, covered by transverse striæ, dividing into two or three near the outer half of the whorle, which is rather flattish and broad, and uniting again on the other side.

The obliquity of the curve of this shell, and the smallness of those striæ or radii that cover the last whorle, are the characters that distinguish this from the last. The last whorle is much incurved. Length nearly an inch, width about three-fourths of an inch, greatest thickness half as much. A specimen, or rather a cast, found in the hard chalk near Warminster, in possession of Miss Bennet, measures an inch and a quarter in length.

The specimens here figured are from Hamsey Marl pit near Lewes, in Sussex. I was favoured with them by G. A. Mantell, Esq. and I am happy to show that this rarity is found in the marley stratum, as well as in the chalk, in the neighbourhood of Brighton. I have given two views, the one a profile, the other a more dorsal one, to show that the transverse striæ are narrower at the smaller spire, and wider as they approach the returning spire, where they are about twice as distant. The left hand lower figure shows a front view and the obliquity of the spire. The segment on the right hand was broken off to show the concamerations, but very little of them are perserved.

The contour of the shell should have been shown more swelled in the middle of the figure.

Apl. 1813 published by Jas. Sowerby London.

LINGULA.

Gen. Char. An equivalved equal-sided bivalve shell, hinge none, the base or beak of the valves pointed, and united into a tendinous tube, serving for a ligament of attachment, and which extends over the valves in a membranous form, open at the front.

LINGULA mytilloides.

TAB. XIX.—*Figures* 1 *and* 2.

Spec. Char. Ovate, anterior end slightly truncated; beak indistinct.

Nearly an inch long, and three-fifths wide, the older shells are flatted towards the front, with rather a straightish edge. Shining and of a greyish blue colour.

These are mostly found in pairs at Wolsingham in the county of Durham, in a dark coloured Limestone. I am told they are sometimes larger than the figure. They are preserved so well that they have the appearance of a recent muscle.

LINGULA tenuis.

TAB. XIX.—*Fig.* 3.

Spec. Char. Elongated, lanceolate, anterior end truncated.

About three-eights of an inch long, and not more than one-third in width; flattish, with a bright shining surface, the anterior edge short and straight: colour reddish brown.

This, although not unfrequent in the sandy stones which are so commonly found at Bognor, with the Arca barbata (now Pectunculus of Lam.) which is also found at the Isle of Dogs (see tab. 15, B. M.) has, I believe, generally been

overlooked, from its smallness. It is nevertheless very distinct and pretty when examined. I have only seen single valves, they are accompanied by some Anomiæ, &c.

LINGULA ovalis.

TAB. XIX.—*Fig.* 4.

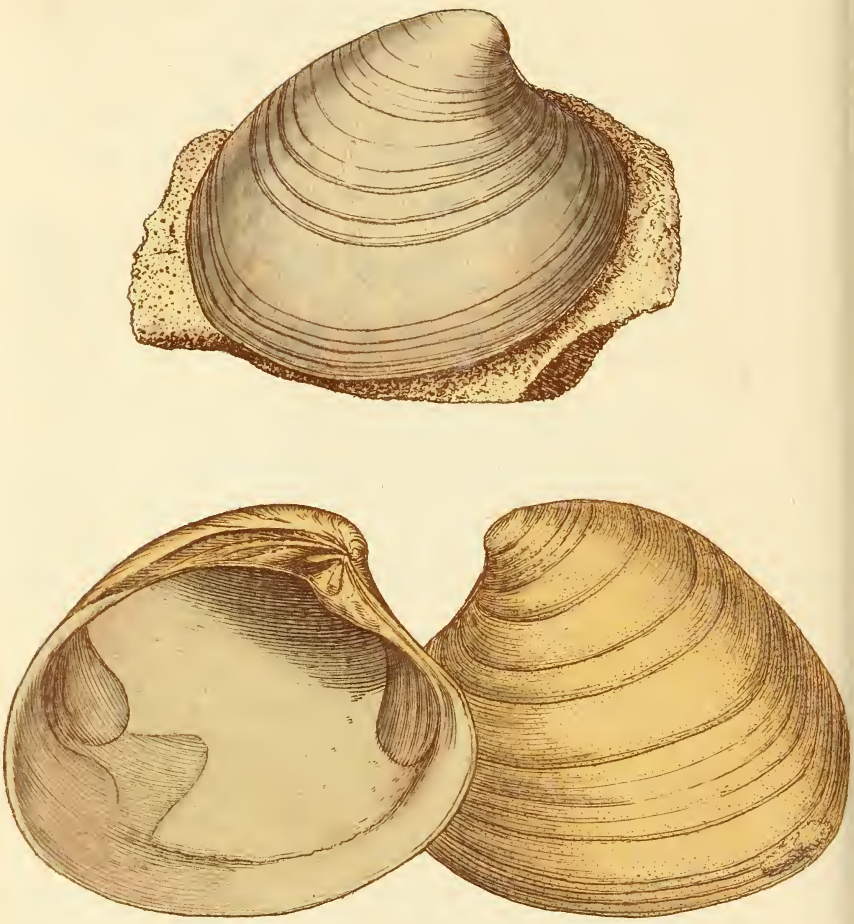
SPEC. CHAR. Depressed, oblong-oval, anterior edge circular, beak very short.

HALF an inch long, a quarter of an inch wide. The young shells of L. mytilloides, although they scarcely show the truncated edge, are to be distinguished by their being more elevated in the middle, and more acute at the posterior edge.

I have only seen a cast of this species, it was found in a lump of a hard white marley stone, among the sand, above the Clay stratum near Pakefield in Suffolk, by Mr. John Thurtell, who has favoured me with some curious shells from that county, it is accompanied by some striated Ammonites, Tellinæ, &c.

This genus of shells does not appear to have been noticed as fossil. It is very rare in the recent state, and I believe but one species is known, which Linnæus, having seen only one valve, very naturally called Patellaunguis.* The specimen from which Cuvier's figure in the Annales du Museum is taken, is one of those which were originally Seba's. Cuvier dissected it, and has given figures of all the parts of the animal, from which it appears that the shell is covered with a membrane, by the action of which alone it is enabled to open its valves. The animal has two tentacula or arms, with which it procures its food and conveys it to its mouth. He found that it has two hearts.

* Mr. Sowerby has published a plate containing figures of the recent species of this genus from good specimens in Mrs. Mawe's collection; it may be had separate.



April 1812 published by Jas. Sowerby London.

VENUS lineolata.

TAB. XX.—*Upper Figure.*

Spec. Char. Rather gibbous, ovato-subcordate; four-fifths of the surface covered with obscure zigzag striæ; anterior side smooth; edge entire.

Syn. Venus castrensis of Linn. *Parkinson Org. Rem. 3. p.* 187.

Length about one inch and three quarters, width about two inches and an half; the beak is rather prominent, and the thickness of the shell not remarkable; the cicatrix is cordate, but not well defined.

This is the Venus from Blackdown, near Collumpton in Devonshire, spoken of by Mr. Parkinson, and which I had much wished to see, and my wishes were soon gratified, for almost the same day a parcel arrived from Miss Hill, with this extraordinary specimen, which, notwithstanding the great change that has taken place in its substance which is now siliceous approaching to Agate or Calcedony, has the elegant zigzag lines yet distinct. It adheres by its inside to agglutinated sand so strongly, that I could not attempt to get at the hinge without danger of spoiling it; I therefore have placed with it a shell which shows the hinge, and from the outward contour appears to be of the same genus The numerous greenish black particles of Chlorite in this sand characterize the stratum.

This shell does not agree with Linnæus's description of Venus castrensis.

VENUS planus.

TAB. XX.—*Lower Figures.*

Spec. Char. Rather depressed, subcordate, slightly angular towards the anterior side; surface smooth; edge entire.

About two inches and an eighth in length, and two inches and three-eighths in width; a strong but not thick shell; the cicatrix is lanceolate.

A dull corneus appearance, with a semitransparency and plainness of form, have given rise to the name; it is also from Blackdown, by favour of the same Lady as the above. The black particles of sand seem to have decomposed into a kind of ochre.

Apl 1812 published by Jas Sowerby London.

VENUS equalis.

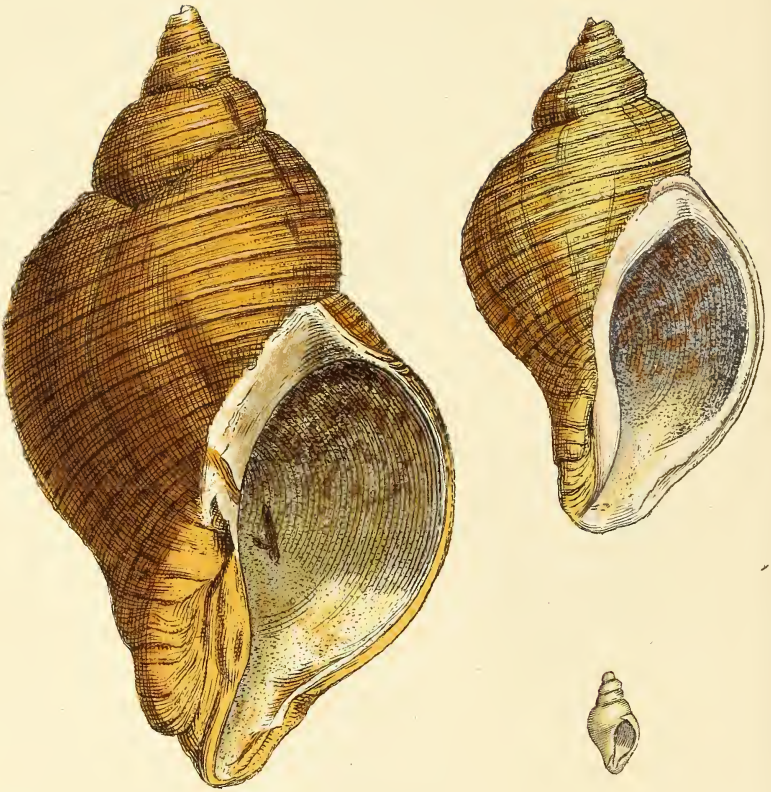
TAB. XXI.

Spec. Char. Uniformly convex, obcordate or nearly circular, covered with numerous transverse concentric striæ; thick, particularly in the middle; margin acute, extended, entire. Cicatrix obscure.

Length and breadth nearly equal; a shell of three or four inches in diameter, is about half an inch thick; the anterior side rather rugged; striæ projecting, sharp. I received specimens of these some years since, by favour of the Rev. P. Lathbury, from Woodbridge in Suffolk; gathered in the cragg-pits. Dawson Turner and William Hooker, Esqs. have also favoured me with fragments. The two upper figures are from one specimen from Elmset, by favour of the first Gentleman; it is the most perfect I have seen. The fragment below is part of a larger shell, and shows the opposite hinge, and at the same time a wearing at the cavity where the cartilage probably was fixed, by which it is remarkably enlarged near the beak of the shell; besides some wearing about the rest of the hinge part, almost enough to make some think it another species. I have received a fragment of this and another species of similar proportions, much resembling Venus Islandica of Linn. from Holywell near Ipswich, found in a cragg pit on Mr. Cobbold's estate. These shells are mostly the Carbonate of Lime remaining from the recent shell, more or less coloured by ochraceous oxide of Iron; they are generally thick, particularly in the middle, and are of a thickly plated

structure. The hinge teeth, which are very thick and conspicuous, may be traced with attention to fit the other shell very conveniently, showing how they lock one into another.

These shells seem nearly allied, if they are not the same species as one figured in tab. 250 of British Mineralogy, which is in flint from Teignmouth, Devonshire. They at first sight resemble Venus Islandica, but they do not appear to be the same as Mr. Parkinson mentions at p. 188 of the third volume of Organic Remains, with which he was favoured by Capt. Gardner. I have a more similar one in sand, it is calcedonic, somewhat translucid with an opaque coating, and was sent me by Miss Hill from Blackdown. The hinge and contour are sufficiently preserved to show that it is not V. Islandica, corresponding with the idea that fossil shells do not accord with recent species.



June 1 1813 published by Jas. Sowerby London.

MUREX.

GEN. CHAR. Univalve, spiral, ovate-oblong; base channelled, varicosely tumid; with rough, spinous or fringed, longitudinal and projecting sutures.

MUREX striatus.

TAB. XXII.

SPEC. CHAR. Shell ventricose, with many transverse rounded projections, and from three to five parallel striæ between each, crossed by other striæ or sutures. Volutions from three to six. Beak nearly straight. Mouth oval.

THE last whorle is much above half the length of the shell, and not very suddenly contracted into the beak. The longitudinal sutures or lines of growth are scarcely rough: the beak is rather wide. Grows to three or more inches in length.

This species, at first sight, much resembles Buccinum undatum of Linn.; the projecting of the canula in our species seems to be its distinguishing character. Some varieties very nearly accord also with the recent Murex antiquus of Linn. in shape, and their resemblance is greater or less as they are more or less worn; both agree in having the mouth on the right hand side. I have figured a full-sized

specimen, though not the largest, of a dark ochre colour, as found in the Essex and Suffolk craig pits, and peculiar to them. The next figure in proportion is of a lighter colour, and is from among many choice specimens with which I was favoured by Mrs. Cobbold, from the pit on the Holywell estate near Ipswich. The small smooth shell at the bottom of the plate is from the same place, and much resembles the young recent shells in the irregular swellings of the spire. This shell sometimes so nearly resembles Murex contrarius, that it has frequently been considered as a variety of that, having the mouth on the right, instead of the left hand side, and is thought very rare. I have them from the smallest to the largest size, selected in pairs, which often renders it really doubtful. It is rather remarkable that the mouths of the shells have a white almost chalky lining.

June 1813, published by Jas. Sowerby, London.

MUREX contrarius.

TAB. XXIII.

Spec. Char. Spire reversed, volutions five or six, slightly expanded at the upper part, and contracted towards the beak: surface with many rounded projections or smooth. Mouth irregularly ovate; beak rather short.

Gmel. Syst. Nat. Tome 1. *p.* 3564.

The last whorle is half the length of the shell, which is often very smooth, and three or four inches long. The spire is longer than in the last, and the volutions more equal.

This has always a more striking resemblance to the recent Murex antiquus of Linn. than the last, but the spire winds the contrary way. It is very rare to meet with a reversed recent shell of that species. The small specimen at the bottom of the plate appears to be a young shell, but the small shell figured in the upper part of the plate differs a little, it is rather longer in proportion, and has alternating larger and smaller striæ; the mouth is reversed also, but broader towards the top, and the canula is lengthened a little. May it not be specifically distinct? if so, it might perhaps be distinguished by its neatness, and called Murex pulcher.

June 1 1813 published by J.& J. Sowerby London.

AMMONITES serratus.

TAB. XXIV.

Spec. Char. Involute, depressed, carinated, inner whorles two-thirds concealed; surface radiated and undulated near the circumference; keel distinct, sharply crenated, containing the siphunculus; aperture narrow, five-angled, half the diameter of the shell in length. Volutions five.

Diameter four inches, thickness one inch. The sides of the whorles are rather concave near the keel, which is nearly cylindrical, and from the sharpness of its crenatures, may almost be called serrated or jointed. The septa are close, with many deep undulations on their margins.

I do not know that this species has ever been found perfect. The upper specimen retains some of the shell in one part very perfectly; we see in it also part of one of the divisions of the shell prettily spreading into the small external sutures, and exposing the passage or hole of the siphunculus belonging to the turn within it; where the shell is lost, the various undulating ramifications, which have a kind of foliage-form, more or less perfect, are explained.

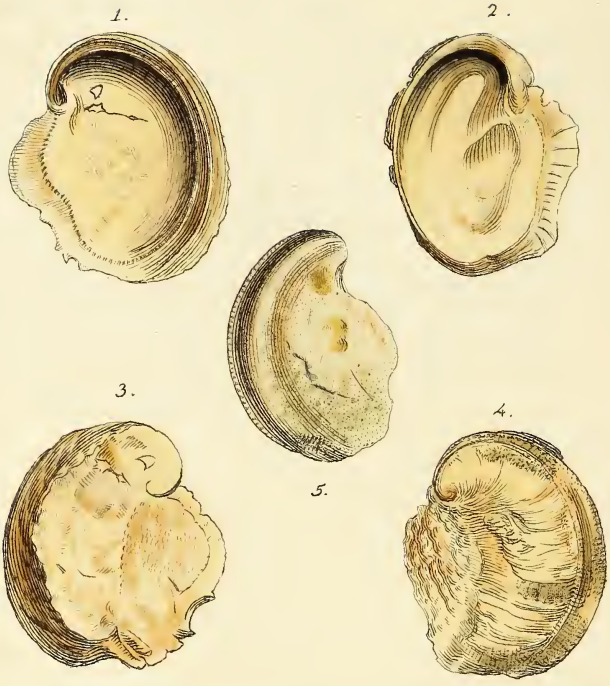
The under figure shows the frequent divisions, and that there are about five rather distinct principal undulations, which divide alternately, and lock into smaller sutures.

The centre whorles are very thin, and frequently lost, as in this specimen.

The middle figure exhibits a cast of one of the chambers formerly distinguished by the name of Spondylithes; it shows the shape and principal undulations of the margin of the septum, with the hole of the siphunculus through it, and the protuberating undulations outside.

When we have learned by some experience, that better are not to be obtained, imperfect specimens of organic remains must be used; they serve well to instruct us, and exhibit the internal organization, &c.

The specimens were a little larger than the figure, and are filled with a brown stony marle; the shell being somewhat like hardened chalk and yellowish, some are more decomposed, softer, and whiter or stained with ochre. They are found in the parish of Worlingham near Beccles, and are lent me by my friend, R. Sparrow, Esq. I have inferior specimens from other parts of Suffolk.



June 1 1813 published by Jas Sowerby London.

CHAMA.

Gen. Char. An attached unequal bivalve with unequal incurved beaks; hinge with one thick oblique and sometimes crenated tooth; two muscular impressions. Often crenated around a great part of the inner margin of the shell.

CHAMA haliotoidea.

TAB. XXV.

Spec. Char. Flattish, oval, uneven, with one longitudinal curved line outside, and a deep curving hollow within the deepest valve, extending from the beak around one side; the remainder very shallow, margin thin, broad, slightly fringed, crenate within. Muscular impression large.

About an inch and an half long, and an inch broad; beaks subinvolute; anterior side of the upper valve marked with a long curved suture, and not fringed, whence it much resembles an Haliotis. Under valve attached by nearly its whole surface.

Figs. 1 and 3 represent the under valve; 2 and 4 the upper valve; and fig. 5 the cast of the inside, showing the crenated edge.

Miss E. Benett of Norton House favoured me with this specimen from the green sand formation in the parish of St. Mary Donhead, Wiltshire. Miss B. remarks that the upper valves are seldom found, although from Dinton, near Salisbury, to Stourhead, the deeper or lower shells of various Chamæ are predominant.

The shells are siliceous casts, and belong to the green sand formation.

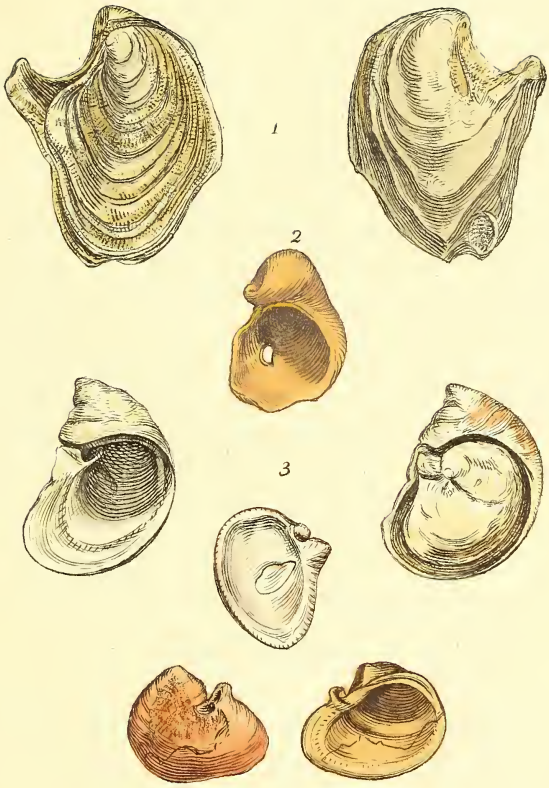
CHAMA canaliculata.

TAB. XXVI.—*Fig.* 1.

Spec. Char. Oblong-oval, flattish, plated; deeper valve with a lateral canaliculated projection, or wing.

Length an inch and a quarter; breadth, exclusive of the beak, one inch. The beak of the deeper valve is much curved towards the wing, but partly obliterated by the surface of adhesion. The beak of the other valve is very short, it has scarcely any wing; the margins of the different stages of growth cover the shells like deep folds of drapery. The surface of adhesion is between the wing and the beak of the deeper valve.

I could not separate the valves, so I judge from the outside appearance alone, that this belongs to the Genus Chama. It is siliceous, and accompanied by the green sand; found in a field at Chute, Wiltshire.



June 1.1813 published by Jas. Sowerby London.

CHAMA recurvata.

TAB. XXVI.—*Fig.* 1.

Spec. Char. Deep valve conical, curved; beak subinvolute.

The hollow valve is a roundish deep shell, the surface is smooth, and the beak turned to one side. Hinge indistinct. I have not met with the other valve, but I suppose it to be flatter.

This also is composed of Silex, and is impregnated with a coarse ochraceous oxide of Iron. It is from Halldown, near Exeter, by favour of T. J. L. Baker, Esq.

CHAMA conica.

TAB. XXVI.—*Fig.* 3.

Spec. Char. Oblong, curved; larger valve deep, with a blunt conical beak, and a small wing; lesser valve oval, flat, with a crenated margin and wing.

Deep valve much larger than the other, about an inch long, and three-fourths wide. The hinge is peculiar, somewhat resembling a ball and socket.

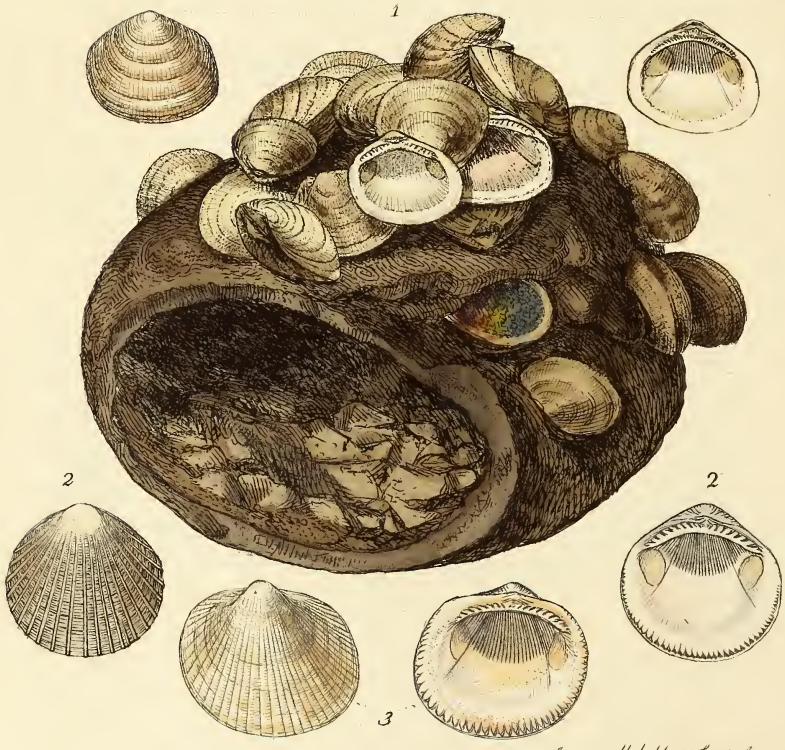
I found this siliceous shell at Chute: its valves easily separated from the cast of the inside, which is composed of sandy marle, mixed with the green granular Talc which characterizes the stratum in which it abounds, and gives it the name of green sand.

CHAMA plicata.

TAB. XXVI.—*Fig.* 4.

Spec. Char. Transversely ovate; beak short; deeper valve with a narrow channelled wing.

Half an inch long, three-fourths wide; wing small, ear-shaped, deeply folded at its commencement, flatter and obtuse at its termination; hinge-tooth obscure or none: margin of the shell crenated within the edge. Surface of adhesion small. I have not seen the flatter valve of this. T. J. L. Baker, Esq. presented me with this specimen from Halldown: it is Silex coloured by oxide of Iron.



June 1.1813 published by Jas Sowerby London.

PECTUNCULUS, *Lamarck.*

Arca, Linn.

Gen. Char. A bivalve subequilateral shell, hinge with many alternately inserted teeth placed in a single arched row. Cartilage of the hinge partly internal, attached to a flat triangular striated surface.

PECTUNCULUS decussatus.

TAB. XXVII.—*Fig.* 1.

Spec. Char. Transversely obovate; sides rather straight; surface covered with numerous longitudinal striæ. Hinge teeth twenty-five to thirty. Margin thick, plain.

Generally about half an inch wide, slightly depressed; besides the lines of growth, and distinct longitudinal striæ, which give the shell a beautiful appearance, there are many very close fine transverse striæ, which can hardly be seen without a lense.

Extremely common among the looser earth from the upper part of the clay stratum, thrown out from the excavation at Highgate, as also in the more dense pyritaceous depressed nodules or septaria, often surrounding the edges in multitudes. The middle figure is from an extraordinary specimen presented to me by the indefatigable friend to science, B. G. Snow, Esq. It was apparently a ball of Pyrites covered with these shells, lying in many directions, some filled with coloured Pyrites; but when broken at one end, it was found to be a rather irregular crust, containing within it a quantity of the new resinous substance in a state approaching decomposition, as it had lost its transparency, and is of an earthy aspect, looking like light brown dry cracked clay, but is readily inflamed. I am glad I had made a memorandum of it, as the Pyrites was in so forward a state of decomposition, that its falling to pieces could not be prevented, even under water.

PECTUNCULUS costatus.

TAB. XXVII.—*Fig.* 2.

SPEC. CHAR. Orbicular, depressed, with twenty-five longitudinal sharp ridges, and a few transverse striæ; hinge of fourteen teeth; margin serrated within.

SHELL thin, somewhat variable in form: some specimens are rather oblique and angular; the ribs are not quite regular, being in some more distant than in others, with here and there a small intermediate one. The beak is not prominent. A few specimens are found an inch or more in diameter, the one figured is of a middling size.

Mrs. Tylee and the Rev. Mr. Bingley, have favoured me with variety of this from Hordwell Cliff. I wonder that Brander has not figured it, as it does not appear to be rare.

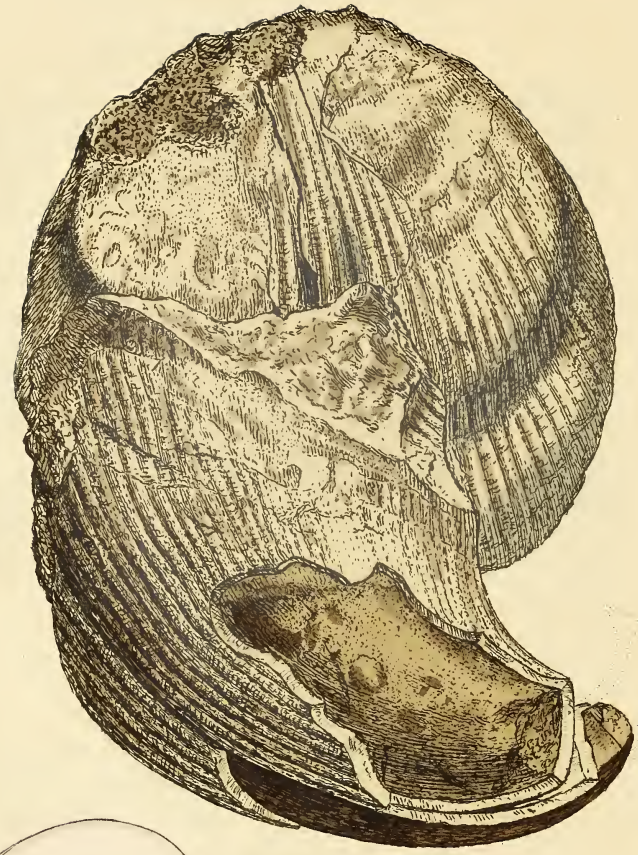
PECTUNCULUS plumstediensis.

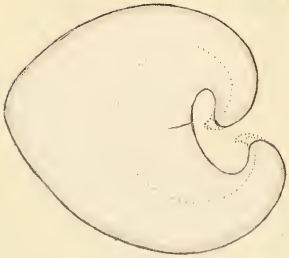
TAB. XXVII.—*Fig.* 3.

SPEC. CHAR. Transversely obovate, slightly oblique, with longitudinal obscure furrows and minute transverse striæ; margin serrated within.

BEAK rather prominent, obtuse; shell thin, nearly an inch wide.

Found in the alluvial sandy gravel of a small hill which contains many good shells, at Plumstead, near Woolwich. I believe it is seldom found whole, being very brittle. I have fragments larger than the one figured, and some minute whole shells; this may occasionally be worth noticing, as it may lead us to improvement in geological science, and probably serve to shew in what cases the shells remain in their original beds.





June 1 1813 published by Jas Sowerby London.

PENTAMERUS.

Gen. Char. An equal-sided inequivalved bivalve, one valve divided by a longitudinal internal septum into two parts, the other by two septa into three parts or valves. Beaks incurved, imperforate.

PENTAMERUS Knightii.

TAB. XXVIII.—*Upper Figure.*

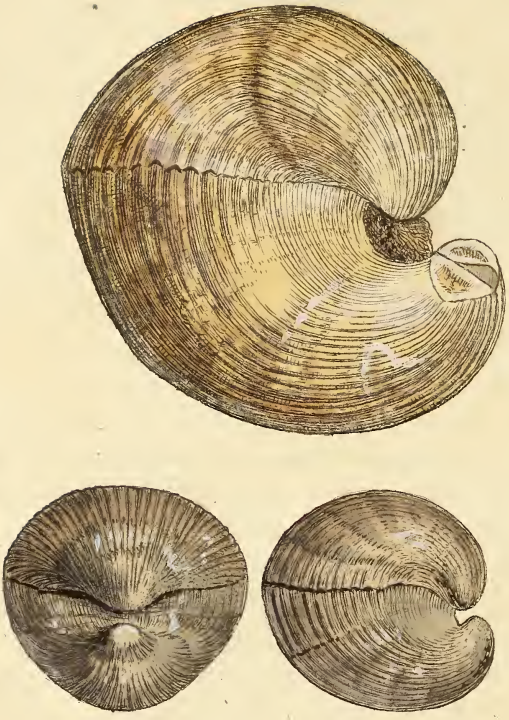
Spec. Char. Circular, with many longitudinal furrows; tripartite valve much depressed, with a short slightly-incurved beak; bipartite valve conical, gradually produced into a long incurved beak.

The septa in the flat valve extend to its edge, they are near each other and parallel. The septum in the other valve divides the beak; the divisions extending to the edge of the shell, form a kind of double beak, much resembling the horny part of the toes of a pig's foot, and leave an angular hollow within the curve; the stone that fills this hollow commonly separates easily, and may at first sight be taken for a third valve of a triangular carinated form. The edge of the deep valve appears to extend over that of the flatter one: the length of the curve from the apex to the edge is often six inches.

About half a mile up the river Teme, near Downton castle, the dell is bounded by two steep rocks approaching

to each other, and the parts of the land above are level and alluvial, as if a lake had been there before the present chasm in the rock. On the southern rock (a dark grey limestone) these extraordinary split shells are found, and are situate about twenty feet above the level of the river. I am greatly obliged to T. A. Knight Esq., of Downton, for the first specimen of this shell in 1809; I have since received specimens from A. Carlisle, Esq., which have much assisted in illustrating its curious structure, collected by him when on a visit to the gentleman abovementioned.

Arthur Aikin, Esq., had observed this formation and the dividing of the under shells, and mentioned them to me at a meeting of the Geological Society in February, 1812, and Mr. Farey was so kind as to send me several specimens with the following interesting observations: "The divided shells which I sent to you were brought from Croft-Ambrey Park Limeworks, Herefordshire, about eight miles S.S.W. of Ludlow: the quarries are in a sudden valley $\frac{1}{4}$ m. N. of Croft Castle, where thirty feet thick of the rock is opened, a dun grey shattery Limestone with blue cores. A great many of the thin beds in this quarry abound with the divided shells in a very perfect state; and, with others, I also saw appearances of Entrochi and Coralloids in this rock, which here dips to the S.E. at the rate of about one in eight or ten, and it appeared to me to be the upper of the three Limestone rocks that I was hastily tracing in this neighbourhood in July, 1812, and to underlie a local patch of Clearhills coal measures, extending hence southward; and though belonging to the same limestone rock as Tinker's, Cairbarn, &c. hills to the N.E. and beyond the Teme, and in Hopton-Wafers, I do not find that they now join, but are separated by the wide excavated vale of the Teme, in the red marle and other under measures to this rock."



June 1, 1813 published by Jos. Sowerby, Lond.

PENTAMERUS Aylesfordii.

TAB. XXIX.

SPEC. CHAR. Nearly circular, with longitudinal furrows; tripartite valve convex, with a prominent incurved beak; bipartite valve gibbous, incurved, conical, with a much incurved beak.

NEARLY resembles the last, differing only in the form of the smaller valve, which is more hemispherical, and has a more curved beak; the edges of the two valves meet in this, which I suspect is not the case with P. Knightii.

I think it possible that this may be another species, and may accord with some of Mr. Aikin's specimens from Yeo Edge. The largest is in the possession of Lady Aylesford, and is the finest I have seen. It is almost necessary to break these specimens in order to see their strongest characters, nor would Lady Aylesford's have been recognized but for the fracture at the apex, which displays the division at the beak. The left hand outline of Tab. 28. is the sketch of a section exhibited by a specimen from Amestry, in a coarse grey Limestone, among others in the possession of G. B. Greenough, Esq., it is of a pink hue, prettily relieved by the dark stone; it is filled with a crystallized mass of a light colour. Mr. Farey has specimens from Croft-Ambrey Park.

I cannot learn where Lady Aylesford's specimen was found; the one of which I have given two views below, and which is rather a wider shell, though scarcely different enough to be considered a distinct species, was picked up by Mr. Ryan at Colebrook Dale. It is from analogy that

I consider it to be of the same genus, for I do not consider it right to run the risk of spoiling the only one I have seen in search of internal evidence. I hope other specimens will soon be found, now that notice is taken of the peculiar structure of the genus, which will clear all doubts.

PENTAMERUS lævis.

TAB. XXVIII.—*Right hand Figure.*

Spec. Char. Smooth, triangular, front rounding, beaks incurved.

Much less gibbous than either of the last; free from furrows, but having slight depressions over the septa; length generally less than an inch.

Not having found this in a perfect state, although I have had stones including hundreds of specimens, I have been doubtful whether I ought to admit it. The Rev. Dr. Abbot, of Bedford, in May, 1812, was so kind as to bring me pieces of rolled Limestone, with these small dividing shells, from near Hopton Court, where he thought they appeared to be left by the swell of the river Teme, and formed a bank three feet or more high.

Sometimes I think there are two species in the stone, a smooth and a furrowed one, but better chance than I have had must determine this; at the same time the formation is distinctly characterized.

The same stones contain the remains of Madrepores. The specimen figured is from Bildwas, Shropshire, collected by A. Aikin, Esq. In some of his specimens I perceived the imperfect remains of small Entrochi.

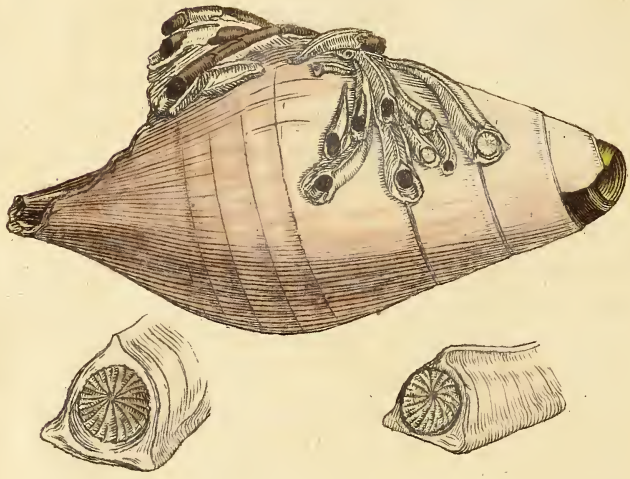
VIVIPARA*, *De Montfort.*

Gen. Char. Univalve, ovate or oblong, with a regularly elevated rounded spire. Aperture entire, oblong, longitudinal, the two lips united angularly above.

The term Helix being by late Authors confined to those shells only which resemble Helix promatia of Linn., we are willing to adopt the generic name Vivipara of Montfort, for such as are like Helix Vivipara of Linn., although it may imply a character that perhaps will not be found in every shell otherwise not generically different. The recent prototype of this genus, being a fresh water shell, analogy would lead us to suppose the fossil shells nearly resembling it to have been inhabitants of fresh water also, which have long been supposed not to have been preserved, but under such circumstances as may be explained, as Mr. Parkinson says, "on the supposition of their having been involved in the gradually accreting tufaceous matter which is deposited by streams and rivers, or in the stalactitical concretions forming the cavities of Limestone rocks of comparatively modern formation." *Org. Rem. v. 3, p.* 86. Those in the tufaceous substance might happen to be the remains of dead shells, even of the current year, and are often of the same species as those living in the rivers or lakes where the deposit has taken place. At

* We believe the shells here described belong to Lamarck's genus Bulimus, but they do not exactly agree in several characters, and moreover the exact prototype of this genus is undoubtedly a fresh water, and not a land shell, as Lamarck's Bulimi are.

the bottoms of the lakes of Kinnairdy in Scotland, when they were drained, there were found beds of a kind of shelly tufa, varying in thickness from two to six feet, covered by sulphureous peat from two to ten feet deep; below this is sand, then clay, and frequently beneath the clay is another thin layer of the shells. Specimens of these were sent me by my good friend Charles Lyell, Esq. in 1808. I found the shells to be the same species as those which at present frequent such lakes. The masses are three or four inches square, very friable, light and delicately white, except here and there a brownish or reddish stain; the shells are delicately preserved in a similar way to those found near Paris, and which so much resemble the Helix planorbis, Linn. The Isle of Wight shells, which are somewhat similar, but as I shall hereafter show, distinct, come next in the order of preservation; in 1807, the Rev. G. R. Leathes brought me specimens from the Isle of Wight, in which, besides the Helices resembling planorbis, are casts of shells of the present genus in a clayey marle. In the Sussex marble also there are often casts of the same genus, and the late General Davies, in 1806, brought me similar ones, found two feet under clay, on the road from Rathersden to Ashford in Kent. Mr. Smith informs me that the clay there is beneath the chalk. From these different localities of shells, apparently of the same genus, we must conclude, either that analogy is not sufficient to prove that these fossils are of fresh water origin, or else that there are more fresh water formations than are generally supposed.



Aug 1. 1812 published by Ja. Sowerby, London.

SERPULA, *Linn.*

GEN. CHAR. Univalve, adherent, tubular, variously curved. Aperture round.

SERPULA crassa.

TAB. XXX.

SPEC. CHAR. Shell acutely conical, round within, three-sided externally, about four times as long as the diameter of the end at the aperture.

ABOUT an inch long, and one-fifth diameter at the mouth, the edges slightly waved, two of them attached to the substance the tube adheres to. Animal with a stellated bony termination to the proboscis.

This Highgate specimen is peculiarly interesting and important, inasmuch as it appears to be the first specimen of the kind noticed or perhaps found, and as it leads to the more attentive investigation of the recent species, the stellated organ that terminates the proboscis being preserved, and apparently serving as an occasional cover or operculum. I had not seen this stellated organ in the recent or living species till about half a year after I possessed this specimen, when upon a visit to Dr. Leach* (to whom the world is likely to be greatly indebted for the learning and assiduity he bestows upon particular departments of Natural History)

* Although this was the only specimen yet known to him or me, Dr. Leach was so generous as to insist on my acceptance of it to elucidate my Highgate specimen.

he showed me an Eschara from Plymouth with a partly upright more cylindrical Serpula with a rounded aperture, with the edge of which the operculum is placed immediately in contact. This organ may perhaps in future serve for distinguishing the genus or species. The Serpula which I have figured for S. triquetra in British Miscellany, tab. 31, has a bell-shaped proboscis, with the addition of a peculiar tongue-like appendage, which gives some idea of a difference in these organs, but my figure is not properly triquetrous, but rather five-angled; and I conceive by the specimens I possess and have seen, that the Serpulæ may be divided much more than they have been. Ellis has a very distinct figure of this instrument, tab. 38, fig. 2.

I have since found in dry specimens of the recent Serpulæ these parts preserved, when the specimens appear not to have been washed; and it may be recommended to those who collect these extraordinary productions, to preserve the animal in spirits, or if, when they protrude from the shell, a piece of paper be put under them, they will often remain very perfect. I preserved those figured in British Miscellany in this manner, and they may be kept thus many years.

The Serpulæ figured in this plate are attached to a fragment of the Strombus amplus of Brander, tab. 6, which is a rare Hampshire shell, and not before known in any other part of Great Britain.

Aug 1 1813 published by Jas Sowerby London.

VIVIPARA fluviorum.

TAB. XXXI.—*Fig.* 1.

Spec. Char. Volutions four to six, convex. Shell about twice the length of the aperture. Lines of growth rather sharply conspicuous, giving the shell a finely striated appearance.

Shell not quite twice as long as broad. When full grown, about an inch and an half long, and seven-eighths wide.

Of the three central figures above the slab, the upper two are filled with a loose kind of marle, the shell being replaced by a dark coloured imperfectly crystallized Carbonate of Lime, in part bleached externally, so as to look like the sun dried remains of the recent Vivipara fluviorum; the lower figure is from a recent specimen, for comparison, from the centre of a pond that has been dried up. The figures on either side of these differ in the length of the spire, but I can only consider them as varieties, for there are several intermediate ones among the specimens from which the figures are selected; the recent shells are subject to the same variations, the larger and longer ones being generally found in the deepest water, as in the Thames and some deep ponds at Hackney. These were presented to me, some by Mr. R. Weeks, and others by the Rev. Mr. Fearon; they are brought from Sussex*.

* I saw a large mass full of shells like these in the Bishop of Winchester's Park at Farnham; it had been picked up in the neighbourhood. Wapping Docks also afforded this shell while digging.

The square figure is from a piece of the Sussex marble taken from the ruins of Lewes Priory, and given me by G. A. Mantell, Esq.; it shows the more or less perfect section or distorted outline of the dark coloured shelly remains, filled with whiter confusedly crystallized Carbonate of Lime: in the grey or brown ground are an immense number of minute bivalve shells, resembling those of bivalve Monoculi,* but now very properly distinguished from the genus Monoculus by Lamarck, under the name Cypris; the form of the shell is much like that of Mya ovalis: in another specimen I received some years ago from Mr. Weeks, there are also many small Viviparæ, probably the young progeny of the larger shells suddenly arrested by fate. The four figures by the sides of the slab exhibit fragments detached from less compact pieces of the marble. The group below is from near Ashford, as before mentioned, the specimens are commonly only casts of the interior of the shell somewhat distorted; on either side are detached varieties. I have never seen the operculum of any fossil specimen.

VIVIPARA extensa.

TAB. XXXI.—*Fig.* 2.

Spec. Char. Volutions four or five, subconvex, lower part rather angular, inner lip swelling a little at the umbilical side, outer lip extended outwards. Shell about twice the length of the aperture.

Smooth, three-eighths of an inch long, rather thin.

This little white specimen so much resembles Helix tentaculata of Linn. that I can hardly pronounce it to be a

* So common in stagnant water at the present day.

distinct species, but the extended outer lip appears to be a distinguishing character. It is a siliceous cast which not being quite smooth, seems unfinished; it was sent me from Blackdown by Miss Hill, where it occurred among shells hitherto supposed to be of marine origin. It has however somewhat the appearance of Turbo canalis of *Montagu*, and may therefore possibly be a marine shell.

VIVIPARA lenta.

TAB. XXXI.—*Fig.* 3.

Helix lenta. Brand. f. 60.

Spec. Char. Smooth, volutions five or six, scarcely angular. Lines of growth occasionally conspicuous. Aperture nearly round, entire.

Spire rather long: shell thickish, an inch long, not half an inch wide.

This shell is found at Hordwell and Barton Cliffs; I am indebted to the Rev. W. Bingley for the specimen figured. The figure in Brander is from a specimen with a broken mouth, the mouth is also engraved rather too round, giving it too much the air of a Turbo, otherwise the engraving is excellent.

VIVIPARA concinna.

TAB. XXXI.—*Figs.* 4 *and* 5.

Spec. Char. Shell rather conical; volutions four or five; slightly convex; lower part rather angular.

Lines of growth indistinct, surface smooth; length three-fourths of an inch.

This has the convex contour of the spire less distinct than the last, and is rather angular in the lower part of the whorles. The spire is also rather shorter and pointed, consisting generally of about four whorles. I am favoured with it from a somewhat sandy part of the strata of Barton Cliff, by Mrs. Tylee.

VIVIPARA suboperta.

TAB. XXXI.—*Fig.* 6.

Spec. Char. Volutions five, convex, with a depressed line along the upper part; a little wrinkled, outer lip folding partly over the upper part of the aperture. Shell about twice the length of the aperture.

Spire acute, surface flattish, smooth, three quarters of an inch long.

This specimen ought perhaps to have been reserved for another plate, as we are rather doubtful whether it belongs to the genus Vivipara; it was sent me by Mrs. Cobbold, from the estate called Holywells, near Ipswich.

May 1 1812 published by Jas Sowerby London.

ELLIPSOLITHES.

Gen. Char. Shell univalve, elliptical, involute, chambered, all the volutions apparent. Aperture lunulate on account of receiving in its inner part the return of the volution.

ELLIPSOLITHES funatus.

TAB. XXXII.

Spec. Char. Shell with numerous transverse simple rounded risings, relieved by rather wider grooves, at intervals a kind of constriction distinguished by a small protuberance on the inner part of the rising immediately beyond it.

Shell smooth; whorles three or four, half concealed; long diameter, three inches; short diameter two and a quarter; thickness, one and an half.

The general appearance of this curious production would bespeak it a multilocular shell, and De Montfort describes it as such; our specimen however does not expose such a character so distinctly as might be desired, yet I believe sufficiently in one part. Although in this respect hardly satisfactory, I could not avoid treating my friends with a knowledge of this curious rarity belonging to the Blackrock range, S. E. of Cork, as discovered by my friend Samuel Wright, Esq. in 1812. It is a fairly elliptical species, and although the specimen is somewhat distorted, the curve is sufficiently apparent to decide upon; besides which there is at intervals a sort of constriction,

distinguished by a small protuberance that perhaps makes it more perfect and certain than any before seen, if it be not a specific difference. They are said to be found along with the Turrilites, at Mount St. Catherine, near Rouen. It is not a little remarkable that it is not found in Sussex or Wiltshire with our Turrilites, for the shell figured by Mr. Parkinson, plate 9, f. 6, which at first sight a little resembles it, and which is found in the same stratum with the Turrilites, is certainly oval or elliptical by distortion, and is of a different species; when most perfect the specimens have a round contour. I have specimens variously distorted. I do not know that any Turrilites have yet been discovered in Ireland: there are however two or more truly elliptical shells.

Those found at St. Catherine are said to be argillaceo-calcareous, ours are a very foetid Limestone, which is very apparent when scraped.

Aug.1 1813 published by Jos. Sowerby Londn.

UNIO, *Lamarck.*
Mya, Linn.

Gen. Char. A transverse shell, having three muscular impressions, two very distinct and the third nearly united to the posterior one; an irregular callous hinge tooth, prolonging itself on the anterior side beneath the ligamental slope, and articulating with that of the opposite valve.

Several species of this genus abound in the Iron-stone stratum of Derbyshire, called the Muscle Band, and elsewhere, in the nodules found in what they call the Blue-bind, or in Bituminous Shale above the Coal, as on Lord Middleton's estate at Woola ton in Nottinghamshire, 75 yards below the surface; they are sometimes partially covered with Coaly matter, and often indicate Coal measures. They are occasionally called Dog's-tooth marble.

UNIO subconstrictus.
TAB. XXXIII.—*Figs.* 1, 2, *and* 3.

Spec. Char. About twice as broad as long, with a constriction running from the front of the shell towards the beak on the anterior side, the end of which is subtruncated.

Rather shallow, generally rather more than an inch broad, and half an inch long.

Not a rare species, it was sent me from Derbyshire by Mr. Jonathan Salt; it is impressed upon a nodule of argillaceous Iron-stone that has become ochraceous upon the exposed surface. Such Iron-stone is found to contain from 25 to 30 per cent of Iron. There is a perforation in the shell, seemingly made by some species of worm.

UNIO uniformis.
TAB. XXXIII.—*Fig.* 4.

Mya ovalis, Martyn Petref. Derb. tab. 27. 28?

Spec. Char. Subovate, beak near the middle of the shell, anterior and posterior ends elliptical.

Width nearly twice as much as the length; rather deeper than the last, and differs also in having the beak nearer the

middle of the shell, and in wanting the constriction and the subtruncated anterior end

Martyn's figures, tab 27 and 28, appear to be the same species as this; they were then understood to be the same species as Mya ovata of Linn. Trans. which was not distinguished from Mya ovalis, but it differs from that in the outline, which is a regular uniform curve, without any angles at the end, as in recent shells. Those specimens that have angles, are evidently distorted ones, and most of them appear to have slipped from the hinge a little. This was found in marle at Felmersham in Bedfordshire, by my very kind old friend the Rev. T. O. Marsh. The specimens sometimes bear so much resemblance to the Derbyshire ones, that they are taken for the same even when found in the alluvial soil near Bedford. Tab. 99, British Mineralogy, exhibits the inside of a pyritaceous cast resembling it, from Bath.

UNIO acutus.

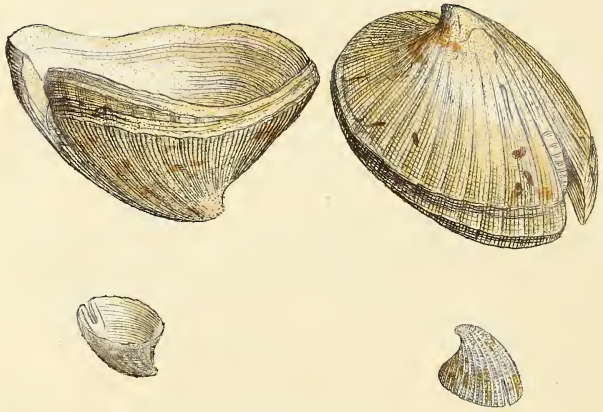
TAB. XXXIII.—*Figs.* 5, 6, *and* 7.

SPEC. CHAR. Anterior side acute, twice as wide as the other which is blunt or rounded. Width two and an half times its length.

POSTERIOR side deeper than the anterior, beak rather angular, size the same as the two last.

Plentiful among argillaceous Iron-stone in the neighbourhood of Bradford in Yorkshire. I am favoured with the shorter variety by Samuel Hailstone, Esq. The other was sent me by Mr. Jonathan Salt; I believe it is from Derbyshire. The lowest figure is taken from one which I suppose to be a cast of the inside.

In order to prove the identity of these shells with the Genus Unio of Lamarck, which their external characters led us to suspect, we have made a cast of the inside of a recent species, upon a comparison of which with several fossil casts we are enabled to give it as our decided opinion, that these shells are undoubtedly of the same genus, consequently we have several species of *fresh water shells* in one of our Coal formations, and we have great reason to believe that the Mytillus crassus figured in Brit. Min. tab. 386, may also be considered as a fresh water shell, as it appears to be an Anodonta of Lamarck.



Oct.1 1813 published by Jas. Sowerby London

EMARGINULA, *Lamarck.*

GEN. CHAR. Univalve, obliquely conical, vertex inclined; anterior or posterior margin with a single deep notch or fissure.

EMARGINULA crassa.

TAB. XXXIII.—*Upper figures.*

SPEC. CHAR. Oval, obtusely conical, furrowed; with four or five striæ between each furrow; fissure wide.

THIS shell is remarkably thick, and the lines of growth are marked across the striæ. The fissure is filled up for half its length by a thinner continuation of the shell.

I conceive this to be a species hitherto undescribed; it was found in the Crag near Ipswich, by Mrs. Cobbold, whose zeal for science prompted her to send me the fine specimen from which this figure is taken. I have not seen another specimen, but consider this a full grown shell, for towards the margin the lines of growth become very strong and irregular, which from analogy may be supposed to point out the usual size. There is besides an additional piece round the edge, produced as it were by an extra effort of growth, similar to that in many old shells. The substance of the shell is about as hard as plaister of paris cast, without any appearance of crystallization, but remains of a glossy smoothness in some of the interior parts; the outside looks like that of a dead, decaying, bleached shell; it is a little stained by oxided Iron. Some animals have formed holes in it, and there are the zigzag grooves of some kind of Serpula remaining in it.

EMARGINULA reticulata.

TAB. XXXIII.—*Lower figures.*

Spec. Char. Shell oval, reticulato-striated, vertex rather acute, principal radii 24 or more.

Syn. Patella fissura. *Linn.* &c.

It is remarkable that this shell is so strictly concordant in every character with the recent Patella fissura of Linn. that it cannot be separated as a distinct species, a circumstance that may be adduced to strengthen the idea of a learned gentleman and friend of mine, that many recent shells may be the same species as the deeper or older fossils, but are more or less degenerated, or have from various causes even assumed such new characters as not to be identified, being more different than mules. The little we know of this subject at present, makes it difficult to comprehend the wisdom displayed on the globe, but as the field is open, and the enquiry began, I hope it will be improved, as I have no doubt of Almighty indulgence, since these relicts are so miraculously preserved, not only for our times, but for ages yet to come, especially as improvement in this science has of late years been very rapid.

These specimens seem but little changed; they were sent from Holywell field with the former, by Mrs. Cobbold in 1812.

MUREX rugosus

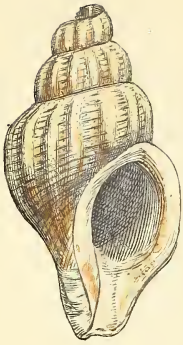
TAB. XXXIV.—*Upper figures.*

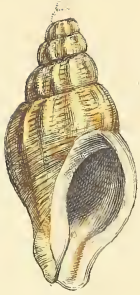
Spec. Char. Spire acute, of about six whorls, rather gibbose, with about ten longitudinal undulations that intersect many deepish transverse striæ. Beak nearly straight, lip thick; canal rather broad.

Syn. Murex rugosus. *Parkins. Org. Rem. 3. p. 64. t. 5. f. 16.*

The mouth and beak together are about half the length of the shell; the surface is smooth between the striæ; it is a thick rugged looking shell, about two inches long and nearly one inch wide.

This shell is said to be one of the rarer productions of the Essex cliff; it is also found in the Crag of Suffolk. My assiduous friend Mrs. Cobbold sent me two specimens from near Ipswich last year, and as they differ a little from each other I figure them both: one is broader and shorter than the other, and wants the left hand lip which in the other spreads over the columella. They are both tender specimens, nearly white, with rather less of the ochry stain than usual to most of the shelly remains of Suffolk and Essex.





Oct. 1 1813 published by Jas. Sowerby Londn.

MUREX Bartonensis.

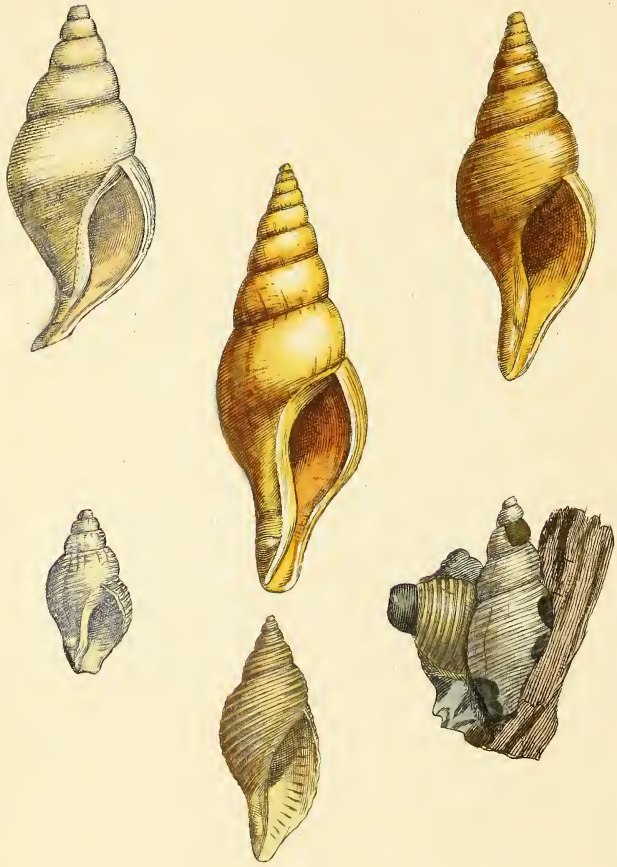
TAB. XXXIV.—*Lower figures.*

SPEC. CHAR. Shell oval, contracted close to the beak, strongly reticulated, whorls about four or five, the last about two-thirds the length of the shell. Mouth elongated, curved, acute at both ends; right hand lip expanded, undulated, toothed within; left hand lip smooth at the edge, toothed within.

LESS than half an inch long; the mouth is twice as long as wide, elegantly curved into a small beak; the outer lip has a furrow at about the fourth tooth from the beak, almost as much extended as the beak itself. The reticulation upon the surface is very square and sharply projecting; it is extended over the back of the lip, and forms its undulated edge.

Two specimens given me some years ago by the Rev. Mr. Bingley differ a little in the undulations of the mouth; I have given two magnified figures of one of them at the bottom of the plate. The small figure in the middle of the plate is the natural size; it is from a specimen sent me by the discerning Miss Bennett; the furrows of the lip are not so distant in this. Barton Cliff is the only place in which we know this shell to have been found.

Murex Rana of Linn. a New Holland species, seems most nearly related to this. I suppose it would be placed under the genus Bufo by De Montfort.



Pubd 1812 published by Jas Sowerby London.

MUREX corneus.

TAB. XXXV.—*Three upper figures.*

SPEC. CHAR. Spire elongated, whorls rounded, rather smooth, with numerous nearly obsolete striæ; aperture angular behind.

SYN. Murex corneus. *Linn. Trans. v. 8, &c.*

THIS is an elegantly formed rather slender shell, $2\frac{1}{2}$ inches long, and about one-third as wide; the beak is often slightly curved. Some of the transverse striæ are more prominent than the intermediate ones, but in old shells, and in fossil specimens, they are generally worn away. The mouth and beak together are equal to half the length of the shell, and are smooth within.

I have various recent specimens of this shell, with and without the epidermis, the former are rather rare. Excepting those with the epidermis, the dredged and what are commonly called good specimens, are scarcely better than the fossil ones. I therefore need now only speak of these of which I have figured three varieties. The middle fine one is by favour of Mrs. Cobbold from Holywells. No. 2 is from Walton; and No. 3 from Aldborough in Suffolk. The first has eight whorls, also the pillar lip, which sometimes does and sometimes does not exist in the recent shells, (it can scarcely be made out in my most perfect recent specimen, but in a bleached one it is so conspicuous as to be almost detached at each end,) it therefore affords no distinction. The right hand figure has no left lip, it is rather a broader shell, and has seven volutions. The left hand figure is nearly destitute of striæ, and the canal is more reflected than usual. It is remarkable that recent specimens of this shell are occasionally found on our coast, much distorted in the lip, widened and covered with the resemblance of an epidermis, the work of a parasite.

MUREX trilineatus.

TAB. XXXV.—*Fig.* 4, 5.

Spec. Char. Shell elongated, with many transverse projecting narrow bands, each obscurely divided into three threads. Volutions five or six. Beak straight, pointed. Aperture elongated; several folds within the outer lip.

This shell is sometimes $1\frac{1}{2}$ inch long, the aperture being about half the length. Its form is nearly the same as the last, but it is more rugose, the transverse projections are equal, and often very neat, they are each divided by two obscure lines into three threads. The outer or right lip has nine or ten elongated plaits or teeth placed a little way from its edge.

I am indebted to the Rev. Dr. Sutton for the group figured, it was with pyritous wood imbedded in an argillaceous-marl Septarium, from Brentford. The same species is found in the Clay and attached to the Septaria at Highgate. The figure below is from an Highgate specimen. I have fragments of shells from thence, which, if perfect, would be two inches or more in length.

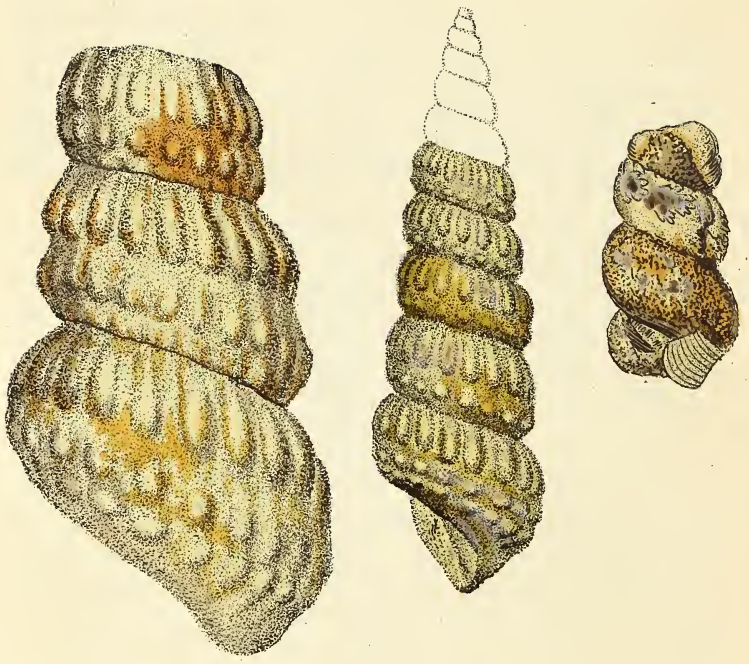
MUREX latus.

TAB. XXXV.—*Left hand lower figure.*

Spec. Char. Shell slightly ventricose, smooth, covered with alternately large and small transverse linear projections. Spire of five volutions, upper part of each volution undulated; mouth strongly striated within. Beak straight, expanded, truncated.

The apex of this shell seems to be rather acute, the mouth is oval, elongated into a wide and short canal: the internal striæ terminate at some distance from the edge of the outer lip, which is entire. Length about three-fourths of an inch.

The Rev. H. Steinhauer brought me this new shell from Plumsted, in August, 1812; I had found mutilated specimens in 1807.



Oct.1 1813 published by Jas Sowerby London.

TURRILITES.

Gen. Char. Shell spiral, turretted, chambered; the turns contiguous, all visible. Chambers divided by sinuous septa, pierced in their disks. Aperture round.

TURRILITES costatus.

TAB. XXXVI.

Spec. Char. Whorls of the spire beset with short ribs, beneath which are two rows of small tubercles.

Turrilites costatus. *De Montfort Journ. de Phys. an 7. p. 1. t. 1. f. 1.*
Parkinson Org. Rem. v. 3. t. 10. f. 12.

Sometimes six inches or more in length, and one and an half inches or more wide.

I am much pleased that Great Britain contains even the cast of this rare and beautiful shell. The larger figures are from specimens found in Hamsey marl pit by my valuable correspondent, G. A. Mantell, Esq. The other which shows part of the septa, is from the green sand at Horningsham in Wiltshire. I am favoured with it by the intelligent Mr. William Smith. Time and attention to the subject may discover finer specimens; but were I to wait for such, I might be disappointed, or the subject might be forgotten. I have never seen any more than casts of what I suppose to be the inside of the shell, and these are generally pressed into a more or less oval form.

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ELLIPSOLITES ovatus.

TAB. XXXVII.

Spec. Char. Gibbose, umbilicated, edges rounded, inner volutions nearly concealed by the outer; surface smooth; aperture obtusely saggittate.

At first sight this has scarcely the appearance of an involute shell, the general form is so round, the inner volutions so nearly concealed, and the aperture, from the narrowness of its sides, so obscure; both sides of the shell are alike, and the umbilicus equally deep in both. The greatest diameter is about twice the thickness of the shell, and one-third longer than the shortest diameter. I have not been able to trace the septa. It is usually obliquely pressed.

I do not know that this has been described in any shape. It is sufficiently remarkable to attract notice, especially as it is one of the various productions of the Black-rock near Cork; which, reasoning from the fossils it contains, Geologists will hereafter distinguish as a particular formation; it is a very foetid Limestone. My thanks are due to Samuel Wright, Esq. and Dr. Wood, for the only two specimens I have seen.

ELLIPSOLITES compressus.

TAB. XXXVIII.

Spec. Char. Shell flat, smooth; margin broad, flat, perpendicular to the sides; volutions four or five, almost wholly exposed; aperture oblong, rectangular.

Both sides are alike, the greater diameter is about one-fourth longer than the lesser; the thickness about one-fourth of the shorter diameter.

This singular production is from the Black-rock range, discovered nearly at the same time by the two gentlemen who discovered that of tab. 32. The upper specimen is partly composed of crystallized Carbonate of Lime, commonly called Iceland Spar, see tab. 2, Brit. Min. with the diagonal striæ mentioned at tab. 260, Brit. Min. The regularity and order of the volutions are very apparent, but the crystallization seems to have helped to obliterate the chambers, if ever there were any: or rather the solution of such parts has proceeded far before the mould was filled. Some parts are rather rough, and a little ochraceous.

The under shell appears to be the same species, although it is rather more elliptic. Both seem to have been included in a very solid part of the rock, as appears from the fragments which adhere to them.

Occleus pub.by Jas Sowerby London

Published by J. Sowerby, London.

MELANIA, *Lamarcke.*

GEN. CHAR. Univalve, turretted, aperture entire, ovate or oblong; inner lip spread over the base of the columella, which is smooth.

MELANIA sulcata.

TAB. XXXIX.—*Middle figure.*

SPEC. CHAR. Spire more than five times the length of its diameter, with spiral striæ; a concave sulcus or furrow between each whorl. Whorls fourteen or more.

A RATHER strong shell, about eight inches long; the surface of each whorl regularly convex, with a margin along the upper part; each one is separated from the next by a narrow groove.

I am favoured with this shell by Mr. John Holloway of Portsmouth, whose zeal in these researches has been useful in many discoveries which he has enabled me to point out from time to time. He found it at Stubbington Cliffs, between Stokes Bay and Southampton water. This Cliff is about twenty or thirty feet high, and is composed of sand and gravel, more or less mixed with blue mud and frequent irregular patches of sand, at the base of this is a stratum, not more than two feet thick, of blue clay or mud, in which the shells are found. He has a specimen five inches long; but the figure is taken, the upper part from one specimen, and the lower part from another: it is remarkable that these specimens seldom have either end perfect; whereas some specimens of Turbines, &c. of Linn. are remarkable for having one end perfect and the other not.

MELANIA Heddingtonensis.

TAB. XXXIX.—*Right and left hand figures.*

SPEC. CHAR. About three times as long as the diameter; whorls eight or more; surface of each whorl concave near the middle, with an obtuse angled rising near the upper part.

A THICK rugged shell, four or five inches long; the lines of growth are deep. The upper part of the whorl is angular.

I have received this from Heddington, near Calne in Wiltshire, and have found specimens about Shotover hill in Oxfordshire, where I have also found the inside cast. Casts of these and other spiral shells are commonly called screws, and are often found with little or no remains of the shells in solid masses of stone, and sometimes have the impression so perfect around them, that the outer pattern of the shells is very distinct, and may therefore often be convenient in a geological point of view to assist us to recognize these casts, for in some places we very seldom find any thing else. I think it desirable here to figure the cast of this shell, as likely to be instructive; besides it makes us acquainted with the particulars of the inside of the shell, and is an assurance of its not being chambered as a Turrilites; see Tab. 36.

Dec.1 1812 published by Jas. Power by London.

NAUTILUS undulatus.

TAB. XL.

SPEC. CHAR. Gibbose; surface largely undulated, sides rather conical, edge flat; aperture obcordate, inner whorls concealed.

THE septa are somewhat numerous, each one is crossed obliquely by an undulation of the surface. The thickness is half of the diameter, and the length of the mouth rather more, with the siphunculus near the centre. A single line runs along the middle of the flat part of the edge or back.*

This species is found in a marly sandstone, a little above the fullers earth at Nutfield in Surrey, it varies in size, being sometimes twelve inches in diameter, forming a very heavy mass, being generally a mixture of Irony marle or clay with sand. It would appear from some that the outer chamber is very large, and therefore the older or larger shells seem to have less of the undulations. I have not seen any specimen resembling this from any other place, wherefore I might have named it Nutfieldiensis, but although it is characteristic of the place, I shall find that trivial name better suited to some other shell which is also characteristic.

* We must be cautious of looking upon this as an indistinct siphunculus, as in some cases it might seem to be.

NAUTILUS inequalis.

TAB. XL.—*Lower figures.*

Spec. Char. Sphæroidal umbilicate; aperture nearly round; septa distant in the inner whorls, and approaching near together in the outer whorls; siphunculus near the inner margin of the septum.

The aperture is obscurely three-lobed from its partly embracing the volution: it is about half the diameter of the shell long, and the same in width. It is remarkable for the septa being more distant as they approach the interior or first formed whorls, where their distance from each other is equal to their own length. The septa are but slightly curved.

The specimen is from Folkstone, by favour of Mr. Gibbs; its chambers are filled with an Irony clay, the remains of the shell being Carbonate of Lime.

Dec.1813 published by Jas Sowerby London

NAUTILUS lineatus.

TAB. XLI.

Spec. Char. Flatted sphæroidal, umbilicate, surface obscurely striated, back flat, broad, with a concave line in the interior (which appears convex around the cast). Aperture rather square, deeply indented by the preceding whorl; septa numerous.

Diameter about one-third longer than the thickness. The septa are very concave, with three slight waves in their margins. The siphunculus is near the middle of each septa.

This specimen is from Comb-down near Bath, and is in the possession of my kind friend Thomas Meade, Esq. whose collection of Fossils is very valuable. I have it also from the Bristol road. I have seen but few specimens of this species, which is so similar to others, that the line passing around the interior of the shell, shown on the surface of the cast, becomes an important distinction, and appears constant. It is said to belong to what is called the inferior Oolite; and from the division of the chambers, has, like others which have been thus divided, been compared to a lobster's tail. I believe it is often much larger. The substance is not always favourable to the perfect division of the septa. The lower figure is added to show the siphunculus; 'tis taken from a specimen I picked up between Bath and Bristol.

Dec 1 1813 published by Jas Sowerby London.

LUTRARIA, *Lamarcke.*

MACTRA, *Linn.*

Gen. Char. A transverse, inequilateral bivalve, gaping at the extremities; two oblique and diverging hinge teeth, one on each side of a large pit for the cartilage. No lateral teeth.

MACTRA gibbosa.

TAB. XLII.

Spec. Char. Gibbose, anterior side much wider than the posterior, recurved, truncated, gaping.

Length and depth about equal; breadth equal to twice the length: the posterior side is rounding and about one-third the breadth of the other; beaks much incurved and pointed.

This fine specimen is from the great Oolite Limestone stratum, near Bath. I am favoured with it by the Rev. H. Steinhaüer. The external characters when compared with those of Mactra hians agree in every particular, but that it has more gibbosity and a boldness of feature in the curve and beak, conveying the idea of an extravagant variety, yet too strongly marked to allow a doubt of its being specifically different. This analogy gives a full sanction to its being considered as an undoubted Mactra of

Linn. which I have ventured to consider it, though I have not seen the hinge. Should any of our friends get possession of a specimen showing that part, I shall be glad of such information as will be decisive, and will give notice accordingly. I have only seen casts. I believe there are several species of this Genus found in a fossil state in this country.

Dec.1.1823 published by Jas. Sowerby London

MYA, *Linn. Lamarcke.*

GEN. CHAR. A transverse bivalve, gaping at both extremities; ligament internal: the left valve with a compressed rounded hinge tooth, perpendicular to the valve, to which the cartilage is attached.

MYA mandibula.

TAB. XLIII.

SPEC. CHAR. Gibbose, flattish in the middle, transversely undulated; anterior side square, gaping, aperture oblong; posterior side straightish.

THE depth is about two-thirds the length; breadth half as much again as the length; the undulations are about twenty-five, following the margin; the beaks are incurved and pointed.

In cutting the Canal at Devizes in Wiltshire, a variety of Micaceous Sandstone and Sand was found, in which many species of shells and shelly remains were concealed, and often only the forms of shells cast in the sand, cemented strongly enough, by compression, as it were, to hold together, as here figured, the cast being distinct, and apparently very accurate. The species here figured is very like the recent Mya truncata of Linn. but it gapes at

one end more extravagantly, so as to give the front view of the opening end nearly a circular contour. The lower figure shows the beaks.

The Micaceous sand, besides having these and other casts, has siliceous and calcedonic ones. That the Silex should replace the Lime of the shells is both curious and beautiful, and the filling a mold, as it were, with almost loose sand, and in looser sand, is not less curious and admirable. Whether we shall ever see these shells so as to identify the hinge we cannot tell. The prominence and appearance of the beak and parts around over the hinge of the shell, looking something like the mandibulæ of a bird, has caused its name.

13 published by Jas. Sowerby London

ARCA.

GEN. CHAR. A transverse inequilateral bivalve, the beaks distant, hinge with many teeth, disposed in a straight line; the teeth lamellated, close, and alternately inserted between each other: a subrhomboidal smooth area between the beaks, on which the cartilage is disposed.

ARCA subacuta.

TAB. XLIV.—*Upper figure.*

SPEC. CHAR. Gibbose, margin an obtuse scalene triangle deeply plaited; breadth grater than the length, surface longitudinally striated.

THE hinge extends nearly the whole width of the shell, forming the longest side of the triangular margin; the teeth are sharp and numerous; the marginal plaits are rounded and very deep, particularly at the anterior side, they are elongated over the surface of the shell, at least I presume so from the impression of the inside, which is all I have to examine.

This happens to show the nature of the hinge teeth externally, else it might have been considered as a Cucullæa, a division or genus of Lamarcke's taken out of the Arca of Linn. and on which the teeth are on a line parallel with the hinge, and which I shall have an opportunity to show hereafter. It is little else than the chalky remains of the shell covering a hardish Limestone Marle. From Sussex, by favour of Mr. Mantell.

ARCA carinata.

TAB. XLIV.—*Lower figures.*

Spec. Char. Very convex, parallellipipedal, anterior side flattish, separated by an acute angle, truncated at nearly a right angle; posterior side rounded; surface longitudinally ribbed.

Above twice as wide as long; hinge straight; beaks slightly incurved. The ribs or striæ are chiefly alternately one rather more prominent than the other; sometimes on the sloping sides there are two faint rising striæ intervening. The angles, of the usual form of those of Arca Noœ *Linn.* are very sharp, and the shell not so wide.

These are from the micaceous sand of the Devizes Canal. They are remarkably neat impressions, shewing the direction of the hinge teeth, if I am not misled by the roughness of the sand. Mrs. Gent was so obliging as to favour me with these, and Thomas Meade, Esq. has assisted me with fine specimens, from his cabinet.

Feb.1814 published by Jas Sowerby London.

EUOMPHALUS *.

GEN. CHAR. An involute compressed univalve, spire depressed on the upper part; beneath concave or largely umbilicate. Aperture mostly angular.

EUOMPHALUS pentangulatus.

TAB. XLV.—*Fig.* 1 *and* 2.

SPEC. CHAR. A prominent central ridge or rising angle on the upper side, the other side obtusely angulated. Striæ of growth hair-like. Volutions almost wholly exposed. Aperture obscurely pentangular, rounded on the outer side.

THIS is apparently a thin shell; the under and umbilicated side is much deeper than the upper, which approaches to flat; there are about six whorls; the aperture is about one-seventh of the diameter of the shell. The striæ of growth are fine and rising. The greatest diameter is from half an inch to two inches.

From the Black Limestone near Dublin, by favour of Mr. T. W. Moore. It is apparently one of the characteristic shells of that rock, of which I shall have more to say hereafter. The specimen figured is curiously waved with a darker and lighter tinted Limestone; it emits a foetid odour on being scraped with a knife. The aperture is not quite filled up; rhomboidal crystals of nearly transparent and whitish Carbonate of Lime form the innermost lining, next is the darker Limestone, and then the shell seemingly replaced by a mixture of the lighter and darker stone. Sometimes the upper side of the shell is very black. I have not seen a perfect mouth among a number of specimens, although some are otherwise very neatly and finely preserved. There may possibly be much larger specimens; I have some very small, about half an inch in diameter. The left hand upper figure shows the upper side is flatter than the opposite side, which is represented in the right hand figure. Sometimes the specimens have a more oval form, apparently from accident.

* From *ευ bene*, and *ομφαλος umbilicus*. I conceive myself justified in giving this Generic appellation, as the shells of which the Genus consists do not agree with any Generic character before published.

1814

EUOMPHALUS catillus.

TAB. XLV.—*Fig. 3 and 4.*

Helix catillus. Martin Petrif. Derb.*

Spec. Char. One prominent ridge upon each side: Volutions almost wholly exposed: Aperture a triangle, two sides of which are much longer than the third: umbilicate side an hollow cone.

Probably as thin a shell as the last; its proportions are about the same; the principal difference lies in the prominent ridge on the under side, which gives the aperture a triangular form.

It is now ten or twelve years since I received specimens of this shell from Mr. Martin, the late intelligent Author of "Petrificata Derbiensia;" it is found at Tideswell, Winster, Buxton, &c. in Derbyshire. He observes that the specimens are very much compressed in the shale which interposes between the Limestone and Gritstone strata. Mr. Parkinson has figured a similar, but perhaps plainer species of this Genus as approaching the Delphinula, and rather unfortunately quotes Brander's Fossilia Hantoniensia, Tab. 10. F. 7 and 8 *(which is a Solarium of Lam.)* as an example. Walcot has also a specimen, probably of this Genus, as a Bath Petrifaction, Fig. 56, Both are probably different species. I have not yet seen such from Bath.

Judging from a fragment I received from my kind friends Mr. Winsor and Mr. Ducket, in Nov. 1810, I should guess that a very similar species is found at Scalaber near Settle in Yorkshire, which is four or five inches in diameter.

* Catillus signifying a little dish or porringer, which it may be considered as resembling when placed with the upper side downwards. The next species might, however, with as much propriety, be designated by the specific name Catinus, a large porringer.

Published May 1, 1839 by J. & H. Sowerby, London.

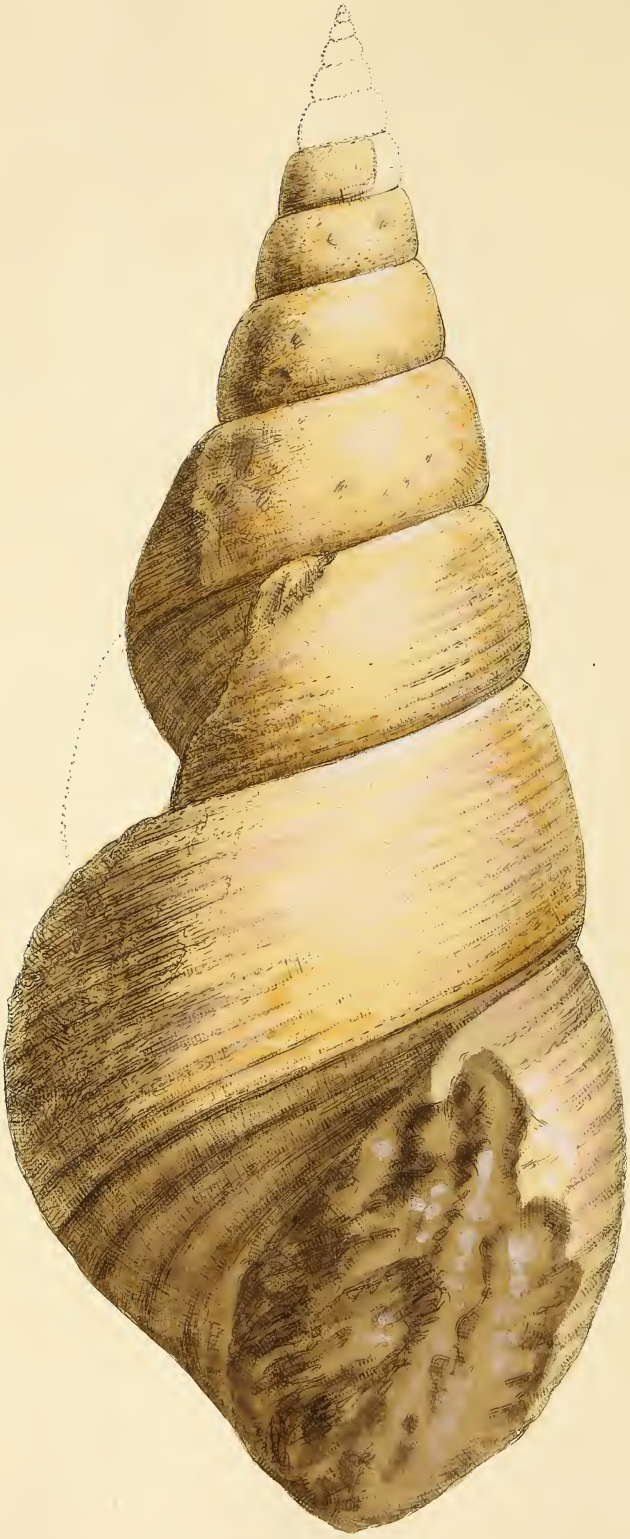
EUOMPHALUS nodosus.

TAB. XLVI.

SPEC. CHAR. Upper side having a nearly central ridge, under side a row of rather large nodular projections: Aperture nearly round.

A MUCH larger shell than the last, with the same number of whorls, and an aperture above one-third the diameter of the shell. There are about ten projections to each whorl; those of the inner whorls being half concealed.

The late Mr. Martin also favoured me with this specimen as a Derbyshire one; he has neither figured nor mentioned it further as I know of, nor is it noticed by any other author. It is sometimes a large shell, as, besides the specimen of which I have here figured the upper and under side, I have a fragment with four nodular projections that fits on this at about the fifth projection beyond the end, which would make it much larger, at least twice as big, and give the cavity a remarkable depth. The nodular or under side of the shell is placed uppermost in the plate because most characteristic. The lower figure or upper side of the shell much resembles that of E. catillus, the ridge however is nearer the middle. The whole is Limestone, the shell rather thin and mostly crystallized or decomposing and chalky.



Feb 1 1814 published by Jas Sowerby London.

MELANIA striata.

TAB. XLVII.

Spec. Char. Length about $2\frac{1}{2}$ times as long as the greatest diameter. Whorls six or more, with about sixteen rounded or spreading carinæ, nearly equal on the outer part of the whorls, but widened in the concealed parts.

This shell appears sometimes to exceed eight inches in length; the surface is smooth, with sixteen sharpish longitudinal striæ, and as many rounding projections.

The upper part of this figure is taken from a specimen found at Lymington, Somersetshire, and sent me some years since by my late Friend Mr. W. Cunnington; the lower part from one found in what is called the Coral rag stratum at Goat-acre, Wiltshire, by favour of the Rev. H. Steinhauer in 1813. I have placed the two pieces together to show the appearance and size of a more perfect whole; they accord so well that one might seem to have been broken from the other, and the wearing of the specimens also accords, for the upper part of the under specimen has almost lost the appearance of striæ, while the upper specimen is so worn that it would have hardly been recognizable as the same species, were it not for the agreement in the proportions and the striæ on the under side. Geologists will know whether they are

from strata of the same age, and perhaps where to find larger and more perfect specimens, now that the age is so much enlightened in these researches that we are continually gaining more knowledge, and individuals do not so slightly notice these things which promise so much instruction and usefulness.

Fisher sc. published by Jas Sowerby London.

OSTREA.

Gen. Char. A rugged inequivalved bivalve; hinge without teeth; pit of the hinge transversely striated*, increasing with age (or commonly broader inwards); cartilage half internal. One muscular impression in each valve.

OSTREA Marshii.

TAB. XLVIII.

Spec. Char. Oblique, both valves deeply plaited in seven or eight angular diverging undulations; edge thick, flatted.

This is a strong depressed shell very variable in form, though generally longer than wide, and often furnished with an obscure ear upon the posterior side. There is such variety among the recent individuals of the Oyster tribe, that it is one of the most difficult tasks in Conchology to distinguish the species, much more so when we add the fossil and otherwise antient remains, which, however, are seldom replaced but by a siliceous infiltration between the laminæ becoming, Calcedony, &c.

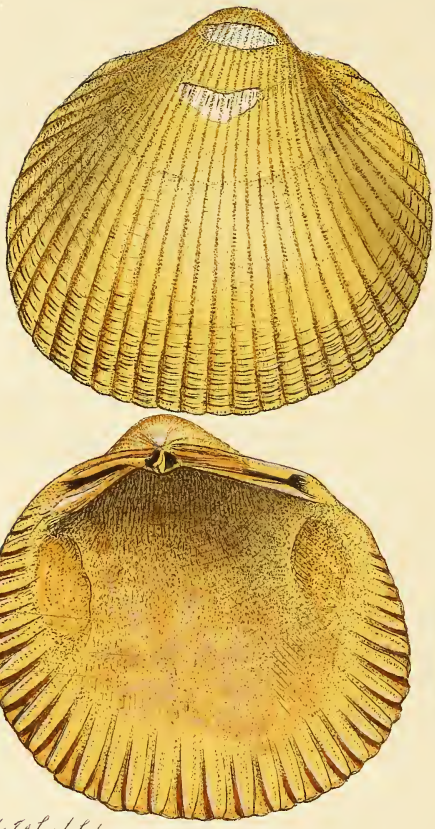
The present species, nevertheless, from its first appearance, seems to claim a place as perfectly distinct from the

* Tripartite, central division generally broadest, to which the cartilage is attached.

conspicuous plaited or sharp zigzag undulations, but this might be traced by an attentive selection of specimens by degrees to the common oysters. This being the case, I may perhaps err when I make this shell distinct from O. diluviana *Linn.* Our shell does not very clearly show the erect acutangular teeth, but is rather more irregular, and the many specimens I have examined, have as many various figures, being rather oblique chiefly to the right, but often to the left; wider than long; roundish, semi-lunate or ovate; more or less imbricated, sometimes very deeply; the inside varying in depth, and the cicatrix or muscular impression very variable. They are gregarious, parasitical, or independent.

The upper specimen is bleached and weathered, as it were, by exposure, differing but little probably in its substance from a recent dead oyster shell, that has been exposed some time on the sea shore. The lower specimen is less altered; the inside of one valve is shown to expose the muscular impression, the other shows a concave furrow of adhesion near the hinge, which is scarcely perceptible in our specimens.

I name this after an assiduous investigator, the Rev. T. O. Marsh of Felmersham, in whose neighbourhood it is found abundantly in all its varieties, and to whom I am obliged for specimens.



Feb.1.1814 published by Jas. Sowerby London.

CARDIUM Parkinsoni.

TAB. XLIX.

Spec. Char. Gibbose, rather oblique, posterior side straightish; surface slightly rugose, with nearly forty longitudinal ribs, having slight transverse risings on each.

This elegant shell is larger and more delicately formed than our Cardium edule, or any of its varieties; it is also less angular or acute at the posterior side; the number of striæ is generally about thirty-six, with some differences in their relief. The transverse rugæ, which are most prominent near the margin, are less numerous than in the common Cockle. The inner marginal teeth are distinctly incurved. I do not know of a similar Cockle in a recent state, although it has but few distinguishing characters: it much resembles Cardium maculatum, *Lister* 328, No. 165; from the bay of Campechy, which has thirty-one ribs.

This very neat and perfect specimen was presented to me by Mr. Parkinson, who, as a sort of Volunteer in the Natural History of Organic Remains, has been so deserving of remembrance, that I felt it a kind of duty to give it his so respectable name.

The Craigs afford some other species, but I have only received this from Mr. Parkinson, besides somewhat smaller

specimens from Mr. D. Turner and Mr. Hooker, found in Norfolk. Mrs. Cobbold has sent me a fragment of a larger still from Holywell, but it seems to be a thicker shell, and promises, from so much as I possess, to be another species. So good a specimen as this may therefore prove rather rare: it is from the Essex cliff at Harwich. The shell is probably Carbonate of Lime, little changed except by being stained by Iron ochre.

Feb.1 1814, published by Jas. Sowerby, London.

VENERICARDIA.

Gen. Char. An equivalved lateral bivalve, ribbed longitudinally outside, with two thick hinge teeth disposed obliquely and in the same direction; two strong muscular impressions.

VENERICARDIA planicosta.

TAB. L.

Spec. Char. Subcordate, very thick, smooth, ribs broad and flat, about twenty, expanding into each other towards the margin; a few large teeth within the posterior edge.

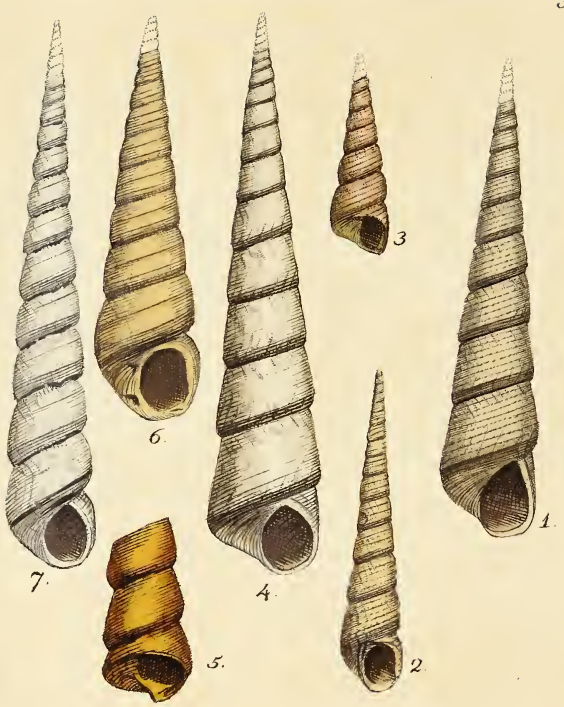
Syn. Venericardia planicosta. *Lamarcke, Ann. du Mus.* VII. *p.* 55. IX. *Tab.* 31, *Fig.* 10.

The thickness of this shell is such as to leave but little space for the animal; it is particularly heavy about the hinge, which is large and very broad; the posterior margin is deeply indented towards the incurved beaks, but without a cordate mark. The length and breadth are nearly equal, often reaching four or five inches.

I was some time since favoured with a fine small specimen from the Geological Society to make a drawing of for this work, but having since received this larger, although not quite so perfect a specimen, from the same place, viz. Bricklesom Bay in Hampshire, by favour of Mr. J. Holloway, I have preferred it for representation. The species is

sometimes larger, when the hinge does not seem to occupy so large a proportion of the shell as in the smaller ones.

Although I do not understand that there are any recent shells of this species, yet the habitat might not be thought very antient, as the shell is apparently but little changed from its original substance or structure. The specimens are said to be very small in the neighbourhood of Paris, and large at Piedmont and Florence. My figure is a little diminished from one about four inches and an half wide. The old and larger shells seem worn on part of the hinge, and the teeth at the edge are almost obliterated, their form is short and broad; the ribs extend most on the shorter side of the shell, and do not reach to the margin as in the smaller ones: the laminated structure of the older shells admits of the outer coat breaking off, so as to show the space between the ribs nearly equal to the ribs and flat, while the furrows in the upper coating are much contracted, ending acutely, when they meet the more prominent transverse striæ of growth near the margin. The whole is nearly smooth and greyish, stained with darker or lighter ochraceous Iron, &c.



Mol. LIB. 4. published by Jas. Sowerby, London.

TURRITELLA, *Lam.*

Gen. Char. Shell univalve, turretted. Aperture entire, rounded, and having the two lips separated above. A sinus in the right lip.

TURRITELLA conoidea.

TAB. LI.—*Figs.* 1 *and* 4.

Spec. Char. Lower part of the whorl angular, slightly projecting, longitudinal striæ equally distant, seven or more, with intermediate smaller ones, all acutely crenulated.

Whorls about eighteen; the sides of the spire are nearly straight with an angular spiral groove; the right side of the mouth squarish.

This is from Barton Cliff, Hampshire, and very nearly accords with Brander's Tab. 3, F. 47, Turbo terebra, which is probably intended for the same shell, the striæ varying somewhat, and the aperture, being mostly broken, giving a sufficiently rounded appearance for the Turbo of Linnæus, in which Genus the modern division may be useful in many respects to prevent difficulties in distinguishing species. I would not consider Brander, F. 49, as the same species, it has too many differences; the volutions being more oblique, &c. in which I believe it will accord with a species hereafter to be considered.

Fig. 4 represents a specimen from Stubbington, where such are found abundantly; it appears to be a worn specimen of this shell, it bears some resemblance to a screw, whence the Generic name Haustator is taken, by some authors, but perhaps unnecessarily. I have a very neatly marked specimen from Highgate. I believe it was very rarely found there.

Fig. 5 is a piece from the Craig at Holywell, with which I am favoured by Mrs. Cobbold, showing the many coned structure when worn away distinctly.

TURRITELLA elongata.

TAB. LI.—*Fig.* 2.

SPEC. CHAR. Whorls flatted in the middle, lower parts projecting, striæ more distant near the middle of the whorls, inconspicuously crenulated, with some finer intervening striæ.

THIS is longer in proportion to its width than the last, it is also smoother and more irregularly striated. The whorl may be divided into three parts, viz. the upper part rounding, the middle part flat, and the lower part rather angular and overhanging, as it were, the upper part of the whorl below it. Whorls about fifteen; length nearly two inches.

Turbo vagans of Brander, T. 3, f. 50, much resembles this, but it can scarcely be determined by his fore-shortened figure. My specimens are from near Christchurch, Barton Cliff, &c. in Hampshire.

TURRITELLA brevis.

TAB. LI.—*Fig.* 3.

SPEC. CHAR. Spire rather short, upper and lower part of the whorls equally rounded, striæ ten or twelve, finely crenulated.

A CONSIDERABLY shorter shell than the last, with scarcely any appearance of the whorls overhanging each other, whorls twelve; length an inch.

This is from a clay stratum at Barton, it was sent me by my friend the Rev. F. Iremonger, it is a more delicate species than the preceding, and the substance seems but little altered; it resembles ivory.

TURRITELLA incrassata.

TAB. LI.—*Fig.* 6.

SPEC. CHAR. Whorls flattish, with the lower part angular and three smooth longitudinal threads; outer lip thickened in the middle.

LENGTH two inches, whorls about fourteen; two of the spiral threads are much more prominent than the third, particularly the central one, opposite to which, in full grown shells, there is an internal projection that gives thickness to the outer lip; besides this it is altogether a strong shell: the inner lip spreads over an umbilicus.

This is also from Holywell, it has a plain appearance, perhaps from being worn.

TURRITELLA edita.

TAB. LI.—*Fig.* 7.

SPEC. CHAR. Whorls rounded, slightly depressed in the middle, lower parts rather prominent with many obscure longitudinal striæ.

Turbo editus. *Brander, Tab. 3. Fig.* 48.

A LONG slender formed shell with about twenty whorls; length three inches.

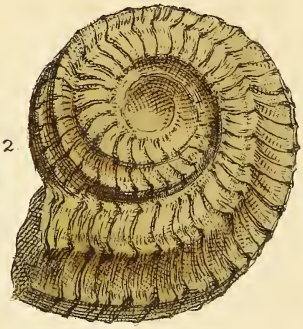
This varies a little, and is very often like Brander's excellent figure. It is generally very chalky, and seems as if it had all the ornaments obliterated or worn, but is not so much so as might be supposed, for my specimen had some fine Flustra that appeared to be cotemporaneous with it, which in a great measure indicates that although somewhat worn, it never was very full of ornament, but always nearly as represented.

Most of the species of this Genus are very abundant wherever they occur, and every one is liable to vary, which makes it difficult to distinguish the species; how far I have divided them right can hardly be determined till more figures, specimens, and experience gives the necessary aid.

Fig. 7 may possibly be an older shell of the same species as fig. 2.

1

2



3

Arch. 1819 published by Jas. Sowerby, London.

EUOMPHALUS.
TAB. LII.

I have placed the following under this new Genus, as rather agreeing with it than with Delphinula, where the penetrating Mr. Parkinson has doubted the propriety of placing them.

EUOMPHALUS discors.
TAB. LII.—*Fig.* 1.

SPEC. CHAR. Above subimbricated with four spiral projections, beneath nearly smooth.

RATHER conical, with three or four volutions, the imbrications are most prominent over the spiral projections, one of which forms the margin of the whorl; the diameter is about two inches, the length little more than three quarters: aperture nearly circular.

The specimen was presented to me by Richard Duppa, Esq. in 1810, it is a beautiful one from Colebrook Dale. The lower figure shows the under side, which differs so much from the upper as to constitute a peculiar character. I have therefore called it discors.

EUOMPHALUS rugosus.
TAB. LII.—*Fig.* 2.

SPEC. CHAR. Above subimbricated, with four spiral projections; beneath plaited, margin rather acute.

THE general shape of this shell is much like the last; the form of the mouth, which has two sharpish angles, and the undulating plaits beneath, distinguish it well. In this species one of the spiral projections forms the margin, and the other the inner edge of the whorl.

I am favoured with this from Colebrook Dale by Mr. Ryan.

EUOMPHALUS angulosus.

TAB. LII.—*Fig.* 3.

SPEC. CHAR. Above subimbricated, with three spiral projections, beneath striated, with five obscurely plaited spiral projections. Aperture obscurely octangular.

THE upper surface is nearly as in the last. On the under side the transverse plaits are partly obsolete in four longitudinal ranges, between the five ridges, forming three sharpish angles to the upper, and five to the lower half of the aperture. Diameter less than an inch. The ridges do not always interrupt the inner contour of the aperture.

The specimen from which this drawing is taken, is in the valuable collection of the great friend to this branch of Natural History, Thomas Meade, Esq. It is altogether a little disturbed, as if it had been in a soft state when it became petrified, and is thus irregularly round.

These three species all partake of an appearance as if from a similar Limestone stratum. I have seen one from Benthall edge that looked as if it were from the same, but not well enough preserved to enable me to determine to which species it belongs; Mr. Parkinson's Pl. 6, f. 7 and 8, is nearly in the same predicament: is it not my Fig. 2, from the appearance of the under side?

Apr. 1 1814 published by J. Sowerby London

AMMONITES striatus.

TAB. LIII.—*Fig.* 1.

Spec. Char. Discoid, gibbose, inner whorls concealed, obscurely undulated, finely striated longitudinally; septa rather distant, with four large angular folds.

Thickness rather more than half the diameter; striæ extremely numerous and very regular, the aperture is semicircular with nearly parallel edges; siphunculus at the outer margin of the septum, where it is slightly notched. The shell is very thin.

This resembles the species in Sir Edward Hulse's collection, that was Lethieulier's, and is figured in three views in Tab. 19 of his M.S. in that Gentleman's valuable Library, it is said to be found in Pools-hole in the Peak, Derbyshire. It seems to be the less globular variety mentioned by Mr. Martin in his description of Nautilus sphæricus, our next figure. I suppose our specimen to be from near Buxton or Castleton in Derbyshire. I believe the shelly remains are very seldom so perfect as in this specimen; and it is somewhat convenient that they did not quite cover it, as the zigzag septa would then have been entirely hid. The shell must have been beautifully delicate when in a recent state, as the elegant transverse undulations pass in very fine semicircular curvatures, with the sharp ends meeting in points upwards (only to be seen with a magnifier), passing into straighter lines by degrees to the sides. The zigzag separations are very distinct without passing into the foliated sutures that characterize most of the Ammonites.

AMMONITES sphæricus.

TAB. LIII.—*Fig.* 2.

Spec. Char. Orbicular, inner whorls concealed; septa with four broad angular folds. Aperture narrow.

Martin Petrif. Derb. Tab. 7, Figs. 3, 4, and 5.

The diameter and thickness are nearly equal; in other respects the interior of this shell resembles the last.

I could not discover the shell of this, although I had it in the stone, and the specimen within was a loose part that was enveloped by the remainder, which seemed as large altogether as Fig. 1, but united by degrees with the dark Limestone and lost its form. It is from Derbyshire.

AMMONITES minutus.

TAB. LIII.—*Fig.* 3.

Spec. Char. Orbicular, inner whorls concealed with many distant longitudinal striæ. Aperture lunate.

Thickness and diameter nearly equal. Striæ about twenty-four. Aperture rounded at the sides. It has a small umbilicus. Diameter two or three lines.

Apparently a minute species of this Genus, but being a cast in Pyrites it only exposes the pattern of the external part of the shell and the aperture. From Folkstone in Kent, by favour of Mr. Gibbs. The right hand figure is the natural size, the other magnified. It looks at first sight like a very young specimen of Ammonites sublævis, tab. 54: that, however, was far from being so orbicular when in a young state.

April 1st 1824 Published by Jas. Sowerby London.

AMMONITES sublævis.

TAB. LIV.

Spec. Char. Orbicular (rather depressed when young), inner whorls exposed within the umbilicus which is deep, undulated, and has an angular edge. Septa numerous, with five principal undulations which are repeatedly divided into many lesser rounded ones.

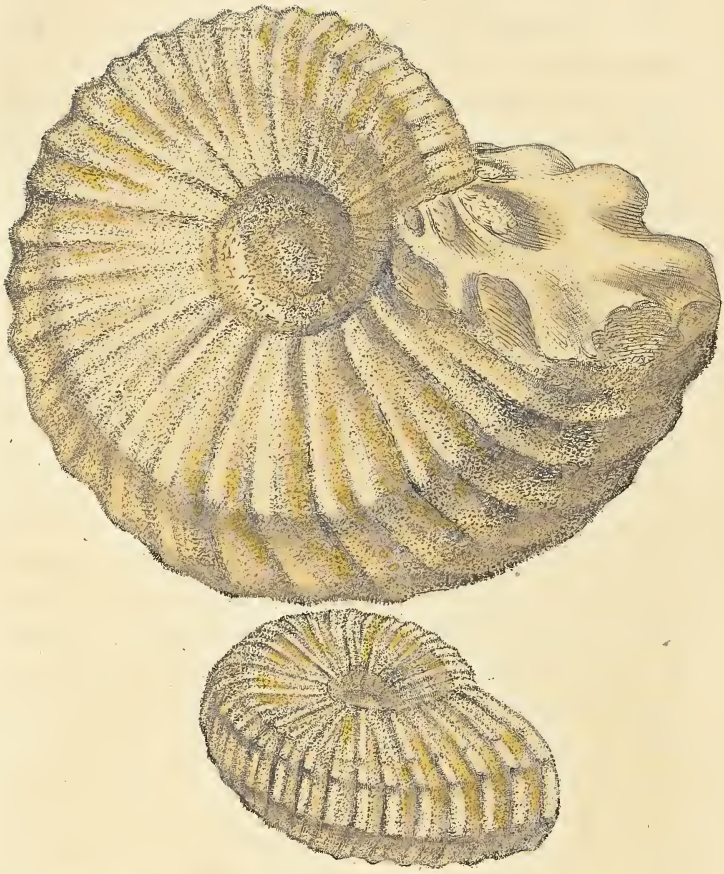
Orbulites lævis? *Lamarcke, Anim. sans vertebr.* 54.
Nautilites, &c. *Luidii Lithoph. Brit. Tab.* 6, *F.* 292.

When full grown about five inches in diameter with a very deep conical umbilicus about one inch and a quarter wide. The shell is smooth on the surface and free from undulations, except within the umbilicus and on the young shell. The margins of the septa traced upon the stone resemble some pinnate leaves, such as those of curled parsley. Aperture very wide, semicircular, truncated at the sides. Siphunculus close to the outer margin.

From Christian Malford, it is undoubtedly the same as the Kellaways rock Lyas shell, and is a fine example of difference in proportion arising from age, getting rounder as it has grown larger. The inner or younger part of this specimen at about a quarter of an inch long is only half as wide as long, and has very conspicuous rising transverse ribs, although so small: these become less sharp or more rounded as the shell advances in growth, being alternately long and short, and some furcate, at about two and an half inches or three inches long these striæ begin to be indistinct,

and they are scarcely if at all to be seen at four or five inches, the external measure of the original. I must observe that some other shells become the reverse or narrower and longer as they grow bigger, of which I shall hereafter show good examples, that may guard us against mistakes in future. A section through the middle is a curious geometrical object, and expresses this part of the subject clearly, for take any part of it as the younger shell it will show that it is longer than wide in proportion as it is smaller*, see the left hand figure. I have got a piece out of the inner part of the large one agreeing with it. The sections in this way often present beautiful specimens, of which I have one three inches in diameter; besides showing the different form of the infant shell, it shows the chambers becoming deeper and squarer, giving a new contour. The middle figure shows a front view of the septa in the young state, when they are broader in the middle. The right hand figure shows that the sides are become broader in the adult state, while it shows also the inner undulations and spreading ramifications of the sutures, and the place of the siphunculus, which is often difficult to discover. I have, however, a specimen from Kellaways by favour of Mr. Salmon, where it is rendered conspicuous by a stain of oxide of Iron. I have marked the spot in the middle figure. The specimens are sometimes very beautifully filled in a variety of ways with crystallized Carbonate of Lime of various colours, and sometimes with granular grey or other coloured Limestone. The divisions of the chambers are sometimes distinct, and sometimes quite obliterated for two or three turns. I have called this species sublævis, as it is wrinkled with transverse furcate costa when young, but otherwise smooth and shining. Colonel Hardwicke has a fine specimen, said to be found in a bed of sand in digging a well at Wisbech.

* More so than is generally the case with a volute.



April 1814, published by Jas. Sowerby, London.

AMMONITES Mantelli.

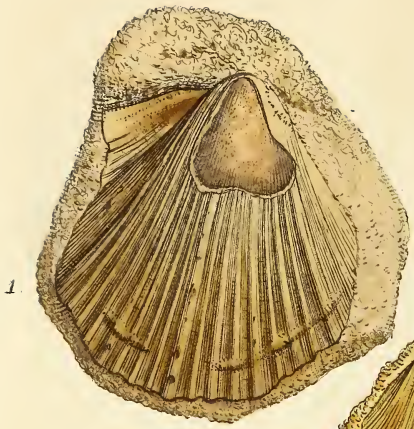
TAB. LV.

Spec. Char. Depressed, edge three-sided, broad, and flattish; sides flattish; volutions undulated, about two-thirds concealed, undulations alternately reaching across the whorl.

The aperture equals about two-fifths of the diameter, which is often four inches, and the thickness about one. The outer edges of the septa have five principal folds. The shorter undulations of the surface reach about two-thirds over the whorl. Aperture obscurely six-sided, one side embracing the next whorl. Whorls three or four.

I am favoured by the indefatigable G. A. Mantell, Esq. with numerous specimens of this species from Ringmer, east of Lewes in Sussex. Good specimens seem to be scarce, and as I had not seen such distinct ones before, I indulge myself in laying before the public the older and younger shell. I have also commemorated my friend in the specific name. The substance is a coarse buff-coloured marly limestone with a few ochraceous stains. I presume the species may sometimes be much larger, and then perhaps the characters may be more obliterated, as appears to be the case in the larger of these. I believe it sometimes varies a little, and has more prominent or knotted joints to the costa and somewhat diversified*. I suppose the siphunculus to be in the outer edge of the septa.

* Of this variety I have lately received a very large specimen from Hamsey near Lewes, by favour of the same Gentleman.



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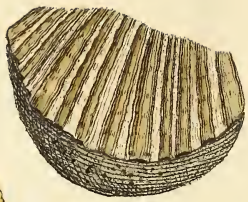

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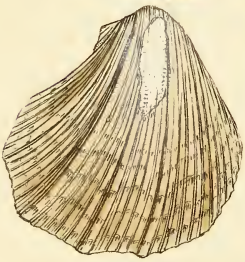

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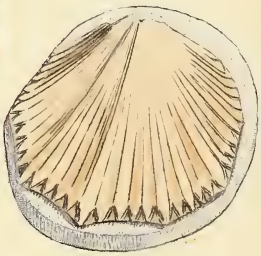

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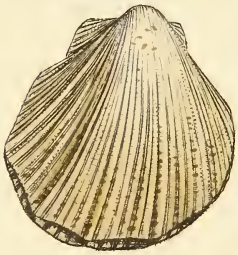


7.

8.

Any one published by Jas. Sowerby, London.

PECTEN.

Gen. Char. A regular, eared, inequivalved bivalve, with contiguous beaks. The hinge toothless; pit trigonal, receiving the internal ligament. One muscular impression.

PECTEN quadricostata.

TAB. LVI.—*Figs.* 1 *and* 2.

Spec. Char. Triangular, nearly even, front semicircular, margin notched. Convex valve ribbed, larger costa six*, three smaller between each. Posterior auricle large.

The length is somewhat greater than the width; surface nearly smooth. There are regularly three small costa between each of the larger, making five sets of four ribs each: near the sides the costæ are less regular and smaller.

This is by favour of T. J. L. Baker, Esq. from Halldown near Exeter, out of the green sand. No. 2 is a fragment, perhaps of the same species, from the green sand at Chute Farm, in the parish of Horningsham, near Longleat, Wilts. They are both siliceous, the latter is much worn, as if rolled. This is perhaps the same as the fine large shell from near Stourhead, represented in British Mineralogy, tab. 183, in which the shell itself is Carbonate of Lime, not siliceous. The Rev. Thomas Rackett has found the same species at Aynswell hill in Dorsetshire, in which the shell is siliceous.

* By some unaccountable accident, five only happen to be represented, which somewhat disguises the figure, but may be understood as now mentioned.

PECTEN quinquecostata.

TAB. LVI.—*Figs.* 4, 5, 6, 7, *and* 8.

Spec. Char. Subtriangular, rather obligue, front semicircular, toothed; convex valves gibbous, ribbed, principal costa six, with four lesser ones between each: surface finely transversely striated. Upper valve flat-toothed.

The obliquity of this shell is slight, the length not much greater than the width; the lines of growth frequently being deep and crossed by the ribs give the shell a fringed or furbellowed aspect: the flat valve has diverging striæ and notches corresponding in number with the costa upon the hollow valve. The whole surface is covered with minute transverse striæ, which in the chalk specimens are often nearly obliterated. Figs. 4 and 5 are from the Sussex Chalk near Lewes, by favour of G. A. Mantell, Esq. they very much accord with those of the green sand from Wiltshire, figured below, but appear to be longer, and to have the transverse striæ of growth very remarkable. The shell represented at Fig. 5 is a curiosity, showing the inner side of the flat valve, which is slightly convex within. I gathered the small shell, Fig. 6, at Chute Farm, it is a young deep undervalve, with the transverse striæ of growth neatly arching between the larger six costæ. Figs. 7 and 8 show the upper and under valves of different specimens, they are from the green sand at Chute, and are chiefly siliceous; for the use of one I am indebted to Thomas Meade, Esq.

Such are said also to be found at Devizes and Blackdown, with the upper valve. It is possible that these are different species from those in the Chalk, the costæ are less prominent, and the striæ more distinct; at present, however, I can consider them only as varieties.

Tab. 56, Fig. 3 represents a specimen in ferruginous Sandstone from Chute, which may possibly prove to be a distinct species. Its length exceeds its breadth by one-fifth, and on the sides of the larger costæ are two lesser ones, which are partly blended with them; the surface is nearly smooth. I have only seen this specimen.

June 1. 1833 published by Jas. Sowerby London.

VERMICULARIA, *De Lamarcke.*

Serpula, Linn.

Vermiculum, Mont. Test. Brit. 2. 517.

GEN. CHAR. Shell a free tube gradually enlarging towards the mouth; spiral or involute at the smaller end; aperture round, entire.

THE Generic Character of Serpula given by Linnæus, including only such shells as adhere laterally to other bodies, and Vermiculum of Montague, (univalve, shape various, not attached to other bodies) not being sufficiently defined, I adopt De Lamarcke's Genus Vermicularia for such shells of the Linnæan Genus Serpula as are not fixed to other bodies*.

VERMICULARIA concava.

TAB. LVII.—*Figs.* 1, 2, 3, 4, *and* 5.

SPEC. CHAR. Discoid, involute, concave on one side; the last whorl but slightly attached.

THIS is almost wholly involute with but a small portion of straight tube: the surface is nearly smooth and even; the involute part is concave on one side only, the other being flat. It seldom exceeds three-fourths of an inch in diameter, with about four turns.

I should suppose the inhabitants of these shells to be gregarious from the number included in the sand, but we cannot determine such things with certainty in fossils, which may, after they have passed from the living state, have been variously disposed, yet there is some room for presumption on this head when we find but little admixture. As the specific character will not include the varieties of this shell, I must observe that the younger shell probably has no appearance of the latter whorl separating from the

* The Serpulæ of *Linn.* are arranged as Vermes by De Lamarcke, to distinguish them from Mollusca or Shelly animals, but their having shelly coverings we may probably include them as better completing the arrangement of shells.

others, while the older shells have it more and more prominent as they advance in age, besides some contortions, such as becoming elliptical, &c. Fig. 1 is a congeries from the green sand at Dilton, near Westbury, by favour of Lord Compton, who possesses the specimen. Fig. 2 shows the upper flat side of the shell. Fig. 3 the lower or concave side. Fig. 4 a vermicular appearance which some of the brown calcedonic parts put on in spots as if the Silex had been dropped in, which spots often accompany shells found in the green sand. Fig. 5 is a mass of hardened marle with Chlorite sand, the same as Brit. Min. tab. 324. which seems to include the same shell, as far as I can conjecture, in it the chain-like section appears. It is probable that this shell belongs to the green sand formation particularly.

VERMICULARIA umbonata.

TAB. LVII.—*Figs.* 6 *and* 7.

Spec. Char. Discoid, involute, umbonated above, concave beneath, the smallest whorl concealed in the umbo.

The concavity of this shell is but trifling, the last whorl, at least in my specimens, is not separated from the others; the central obtuse knob is peculiar. About three-fourths of an inch in diameter, and the whorls two or three.

From the Hamsey marle pit near Lewes, by favour of G. A. Mantell, Esq. Fig. 6 the convex or umbonated side; Fig. 7 the concave side. It is composed of Carbonate of Lime.

VERMICULARIA ovata.

TAB. LVII.—*Fig.* 8.

Spec. Char. Discoid, involute, rudely ovate, rather the most concave beneath.

There are about two or three whorls to this wormshell; the longest diameter is about half an inch.

I gathered it out of Limestone at Shotover hill near Oxford, and figure it as adding but little to the plate, and yet useful for comparison. I may hereafter meet with it in some variety.

ORTHOCERA.

GEN. CHAR. Shell straight or slightly bent, fusiform; chambered, siphunculed; margins of the septa even or with one or two gentle wavings.

IN what manner the shells of this Genus terminate at either end, is at present not well ascertained. The jointed alveoli of some Belemnites, particularly in such specimens as exhibit them continued beyond the more solid parts, very nearly resemble some of the specimens of Orthocera, but as yet I have seen none with a central siphunculus. I have very lately been permitted by the kindness of Sir Joseph Banks to sketch a large specimen, in which the chambered part or Alveolus extends about seven inches beyond the Belemnite, properly so called, and so nearly resembles my Orthocera conica, that I suspect it to be the same species larger*.

We know of many species of Orthocera to which we have seen no Belemnite attached, and the proportions of which will match no Belemnite we are acquainted with. May it not be that the shell of some Orthoceræ is so thin to the very point, as not to be recognized as a Belemnite, and that there is a series from these to such as have the shell so thick and large as to be arranged as Belemnites alone? The discovery of an Orthocera with a thin shell perfect to the end, would go far towards answering this query.

* I hope to receive more information upon this head, when I shall be happy in presenting the figure to my readers.

The following interesting Letter upon this subject I am indebted to Mr. Farey for permission to insert.

"Having collected out and arranged my Notes and references to Authors, as to British *Belemnites*, with or without the *Alveoli* or series of cups belonging to their conical cavities, which Alveoli, when hitherto found separate, have been generally called *Orthoceratites*, by various Authors, (and are said by some recent Writers to *characterize the Transition Rocks of Werner?*) I find them referable to 20 different places in the British series of Strata; extending from (1st) the *London Clay* above the Chalk, to (20th) the Limestone resting on Slate.

"It is the 13th of these Eras, in which Belemnites existed during the deposition (and probably during the Creation also) of the Strata that now rise to the surface or basset in the British Islands, that the very fine and perfect specimen lately found in Leicestershire and Northamptonshire, by Mr. *Benj. Bevan*, the Engineer to the *Grand Union* Canal, of which specimens you lately shewed me drawings, are referable.

"The Stratum to which I allude, is one of *Blue Clay*, situated in the upper part of what I have called the "Lias Clay," in my Derbyshire Report, vol. I, p. 114, or between the *Northampton Freestone* and the *Blue Lias Limestone;* in the range of which Clay stratum across England, I have noted 9 localities of Belemnites, all probably of one species; the two first and most northern of these localities were known to Dr. Woodward, in the early part of the last century, as appears from his "Catalogue of the Fossils of England," vol. I, p. 108 and 110, and his specimens are yet preserved at Cambridge, I believe.

"The 1st, from Ashby, E. N. E. of Market Harborough, Northamptonshire, is described as having two of the cups or chambers within the conic cavity of the Belemnite; the 2nd, from Great Bowden, N. E. of Market Harborough in Leicestershire, is mentioned as having six cups within the Belemnite; 3rd, Mr. Bevan's specimen, sent to Sir Joseph Banks in Dec. 1813, from Husband Bosworth Tunnel, N. W. of the village, in Leicestershire, at 12 feet deep in the 5th shaft; several middling sized ones, in a layer in a lump of Clay, some of them crushed, and a large broken one containing six or seven cups; 4th, his fine specimen sent to Sir Joseph Banks in Feb. last, from 90 feet deep in Crick Tunnel, S. of the village, in Northamptonshire, ($5\frac{1}{2}$ m. N. of Daventry), which you have examined and drawn, and which is perhaps one of the most perfect specimens of the Belemnite and its Alveoli, that is known.

"My 5th note relates to Belemnites found in this stratum near Cheltenham Town, Gloucestershire, which were in the possession of the late Fletcher Bullivant, Esq. of Stanton Ward in Derbyshire; the 6th, at Frocester Hill, W. of Stroud in Gloucestershire, of which Mr. W. Smith has specimens; the 7th, near Lansdown, half a mile S. of Tog-Hill, N. of Bath in Gloucestershire, described in Mr. Walcott's "Petrifactions found near Bath," p. 35, tab. 45, fig. B; but possibly this may belong to my 12th situation in the series? the 8th, E. of the town of Bath, according to Mr. Smith; and the 9th, at Tucking-mill in Monkton-Comb, S. E. of Bath in Somersetshire; large with their Alveoli, Mr. Smith.

"I would beg to recommend it to the Readers of the "Mineral Conchology," and your Correspondents in general, to assist in increasing our list of these important Extraneous Fossils, by sending you as many perfect specimens as they can, *out of Strata*, whose exact situation and nature they can describe, along with them.

JOHN FAREY, Sen.

Jay, sculp. Published by J. & J. Arrowsmith, London.

ORTHOCERA striata.

TAB. LVIII.

Spec. Char. Shell tapering very gradually, longitudinally striated, thin; aperture oval, about one-third broader than wide; septa numerous, deep.

The stone filling the last chamber of this specimen, if separated would form a cup about three inches and an half in the longest diameter, and a little more than two in the other, an inch deep, and about three-eighths thick in the middle, with a very thin edge. The septa are extremely thin, blending almost imperceptibly with the outer shell. The siphunculus is about a quarter of an inch wide, and the whole of the specimen I possess is eleven inches long.

This species is in a lightish coloured Limestone found in the Black rock near Cork, and was sent me by Dr. Wood and Mr. Wright, in 1812, who observe that there are much larger in other parts of Ireland. I have two cupped Limestone divisions of a species much related to it from the Kendal Limestone, with Encrini and a small Trilobite imbedded in them, with the siphuncle central, but thicker in proportion to the diameter; they are five inches by four in diameter, and taper so little that a series would be fourteen or sixteen feet long ere they would form a pointed end. We hope this will inspire the curious in these researches to trace these subjects in the rocks ere they detach pieces.

ORTHOCERA undulata.

TAB. LIX.

Spec. Char. Shell oval, thin, smooth; septa numerous, oblique, their edges rising, oval, with a wave on each side. Siphuncle near the upper edge.

The septa are nearly parallel, and but slightly concave, there are five or six to an inch, all equally distant: the siphunculus, placed near the broad side at about one-sixth part from the edge, is about one-tenth of an inch in diameter, the shell diminishes about one inch in a foot. My fragment is six inches long, and one inch three-fourths by one inch and an half wide at the broadest end.

When the shelly part (which is replaced by Limestone as well as the rest of the specimen), is separated, the divisions of the chambers are shown by distinct transverse striæ. Fig. 1 shows the undulation opposite to the Siphuncle; Fig. 2, the side view, shows the obliquity of the septa; Fig. 3 one of the solid casts of the chambers, a little concave and with an undulating margin interrupting the more regular oval which it would have on looking directly into it. The upper part of Figs. 1 and 2 was possibly the terminal chamber, as the transverse septa are not to be seen; or it may be that the stone is more incorporated with it. This is from near the water-force on Scaleber near Settle, by favour of Mr. Ducket.

June 1 1814 published by Jas Sowerby London

June 1.1819, published by J. Taverty, London.

ORTHOCERA conica.

TAB. LX.—*Figs.* 1, 2, *and* 3.

SPEC. CHAR. Shell long-conical, aperture oval, a little wider one way than the other, smooth, chambers numerous, increasing in depth by age; siphuncle nearly touching one of the sides, small.

THE septa have even margins and regularly concave surfaces, they are very thin and twice as distant from each other at the broadest end of the shell; the siphuncle is oval, about half a line wide.

These figures exhibit specimens from the Alum Clay at Whitby, presented to me by the Marchioness of Bath. Fig. 1 is a dark Iron clay stone, the shell chiefly Carbonate of Iron. The edges of the septa have something like a double margin, or a little sulcus, which is occasionally apparent within the shell. Fig. 2 has the shell of a lighter tint with some signs of Pyrites and the remains of the pearly lustre in the division; it is also less conical, and I should consider it as the narrow continuance of the same species. Fig. 3 shows the convex side of one of the septa with the siphuncle near the edge.

ORTHOCERA Steinhaueri.

TAB. LX.—*Fig.* 4.

SPEC. CHAR. Shell transversely striated, very gradually tapering; chambers very deep; septa distant, even-edged, circular; siphuncle close to one side.

THE depth of the chambers, the distance of the septa, and the width of the shell, are equal to each other; the siphuncle is large in proportion to the shell, being half a line where the shell is half an inch. The striæ on the surface are very regular and even.

This neat specimen was found accompanying the Ammonites Listeri, Brit. Min. t. 455, about two miles and an half north of Halifax, on the road to Bradford, in lumps of Limestone mixed with much Pyrites, by the Rev. H. Steinhauer, whose merit in research deserves esteem and remembrance.

ORTHOCERA Breynii? *Mart. Pet. Derb. T.* 39. *F.* 2.

TAB. LX.—*Fig.* 5.

SPEC. CHAR. Shell plain, oval, gradually elongated septa oblique, slightly concave, ovate, numerous; siphuncle near the middle, small.

THE siphuncle is placed in the focus of the broader end of the oblique septa; the outer shell is very thin, plain, and much incorporated with the stone.

I have possessed this specimen some years, it is Limestone from Derbyshire; it agrees in many respects with Mr. Martin's description; his is more rapidly acuminated or conical, in his "the dissepiments are approximate, concave, oblique, almost entire;" but in this the slight wave in the front which he speaks of is scarcely discernible, the oblique divisions of the sides are like the line fig. 5*, allowing it but little undulation. The siphuncle placed between the centre and the edge agrees with ours. This species is said to vary considerably in size; we hope this figure will give occasion to enquiry whether they are the same species or not, and as there is a furrowed species, O. Gesneri, it would be advisable also to look for that with the outer shell, Mr. Martin's specimen being destitute of it. His figure of O. Breynii is destitute of the outer shell also.

ORTHOCERA circularis.

TAB. LX.—*Figs.* 6 *and* 7.

Spec. Char. Shell smooth? gradually tapering, round; septa approximate, slightly concave with even edges; siphuncle placed about half way between the edge and the centre.

Septa about three-sixteenths of an inch distant from each other. Diameter of the largest end in my specimen about an inch.

A rude piece of Limestone from Dudley encloses this fragment; it is without the external shell, but the position of the siphunculus distinguishes it from all others that I have seen. I should not have figured this imperfect shell, had I not thought it convenient to particularize the difference of character in the shells belonging to certain rocks, for the sake of Geology, and even the more or less perfect preservation of the different subjects becomes of some consequence in such enquiries. In some instances we are pleased to find that such small remains have a specific difference.

HAMITES, *Parkinson.*
Baculites, Faujas de St. Fond.

GEN. CHAR. Fusiform; hooked or bent into two parallel limbs, chambered; septa undulated at their margins with a siphuncle at their outer edge.

THE surface has commonly annular undulations, and the siphuncle is at the outer edge of the septum. The septa have six large waves with plated margins, as in Ammonites.

The Genus Baculites appears to have been formerly made from straight fragments of chambered shells; the bent or hooked parts of which, having been since found, have been termed Hamites by Parkinson. The siphuncle seems to have been passed over by Faujas de St. Fond, who describes the septa as imperforate; it is, however, visible in several of my specimens, and particularly so in one from Maestricht, the chambers of which are cast in sandstone and detached from each other, which was lent me by Mr. Parkinson. Some Authors, as De Montfort, speak of and figure a central siphuncle, but we conceive that none of the chambered shells of the same construction as those of the present Genus ever have the siphuncle in the centre.

As far as I know, no whole shells of this peculiar Genus have been found, or even either of the terminations; from hence it is, I presume, that many mistakes have arisen and continually will arise in the division of the species. I have taken up the subject as a means of drawing the attention of Collectors to it, hoping they may do something to improve our knowledge; besides it had become necessary to make figures, as some of the subjects are liable to decompose and be lost, while most of them are considerably lessened in beauty by the decay of their tender pearly shell. The form and position of the undulations upon the surface, and

perhaps even the form of the tube itself, are liable to variation; these are still further difficulties.

Hamites have been found in the Clay at Folkstone, as most of the species here figured; in the Chalk at Hamsey in Sussex, resembling H. intermedius; and also by Miss Benett, in the Chalk at Horton.

HAMITES tenuis.

TAB. LXI.—*Fig.* 1.

SPEC. CHAR. Slender, depressed, undulations obtuse, slightly waved, disappearing on the back of the limbs.

THE compressed shape of this would give the aperture an oval form about half as long again as wide. The undulations are irregular, some reaching nearly to the back, others only half way. The fragment I have figured is straight, and tapers more rapidly than others of the Genus.

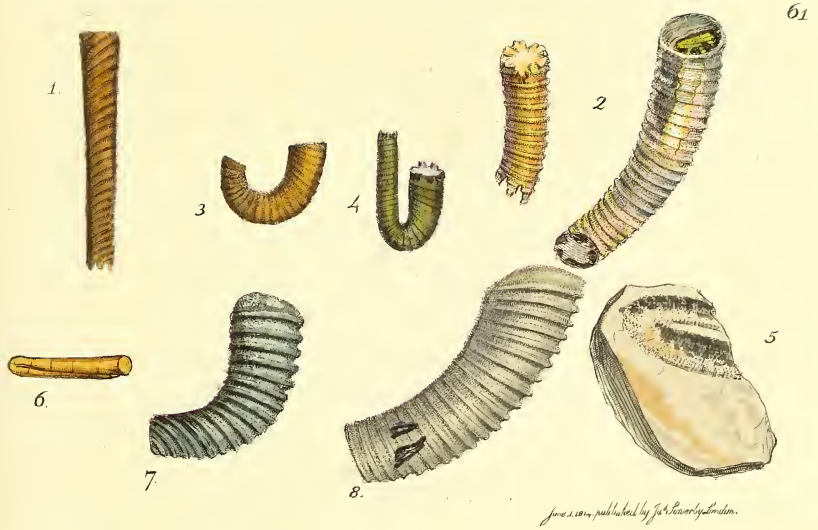
I am indebted to the indefatigable James Gibbs for this and most of the specimens figured in this and the following plate. They were picked up by him in the Clay of the neighbourhood of Folkstone, among Ammonites and various other Fossils.

HAMITES rotundus.

TAB. LXI.—*Figs.* 2 *and* 3.

SPEC. CHAR. Aperture round, undulations obtuse, annular, numerous; the curve of the shell very gradual.

THE regularity of the undulations and roundness of the shell, are the distinguishing marks of this species. Fig. 2



June 1.1814 published by Jas Powerby London.

exhibits two specimens, the largest appears to be distorted laterally, for the septa at the lower end are turned to one side. It is composed chiefly of Iron Pyrites covered with the pearly remains of the shell; its small weight, and the cavity at the upper end, lead me to think that the chambers are left hollow; the other is quite regular. By an attentive examination of the specimen the siphunculus may be traced. Fig. 3 shows a compressed cast in Oxyde of Iron (probably this was Pyrites once). I add it for the purpose of exhibiting the gradual curvature, but with some hesitation, as the specimen is too bad to ascertain with certainty that it belongs to this species.

HAMITES attenuatus.

TAB. LXI.—*Figs.* 4 *and* 5.

Spec. Char. Slightly compressed, suddenly attenuated just below the curve; undulations obtuse, numerous.

The larger limb is suddenly contracted near where it turns into the smaller, which consequently is more slender in proportion, and is round; the undulations are obscure at the back. The specimens here represented are excellent for exhibiting the Generic character, in consequence of the length of the lesser limbs, which are rarely found.

Fig. 4 is cast in dark Iron Pyrites, with the pearly septa remaining. In the engraving the undulations are not quite near enough, particularly on the lesser limb. Fig. 5 is an impression in Clay of a larger shell, perhaps of the same species; it appears to have been Pyrites, and dissolved.

HAMITES compressus.

TAB. LXI.—*Figs. 7 and 8.*

SPEC. CHAR. Depressed, curved at right angles? undulations sharp, slightly waved, most prominent at the back.

OF the oval end the shorter diameter is two-thirds the length of the longer; the undulations are very regular, bending towards the curve.

The lightest coloured of these specimens is marle, the other Iron-stone; the septa are obliterated in both.

HAMITES maximus.

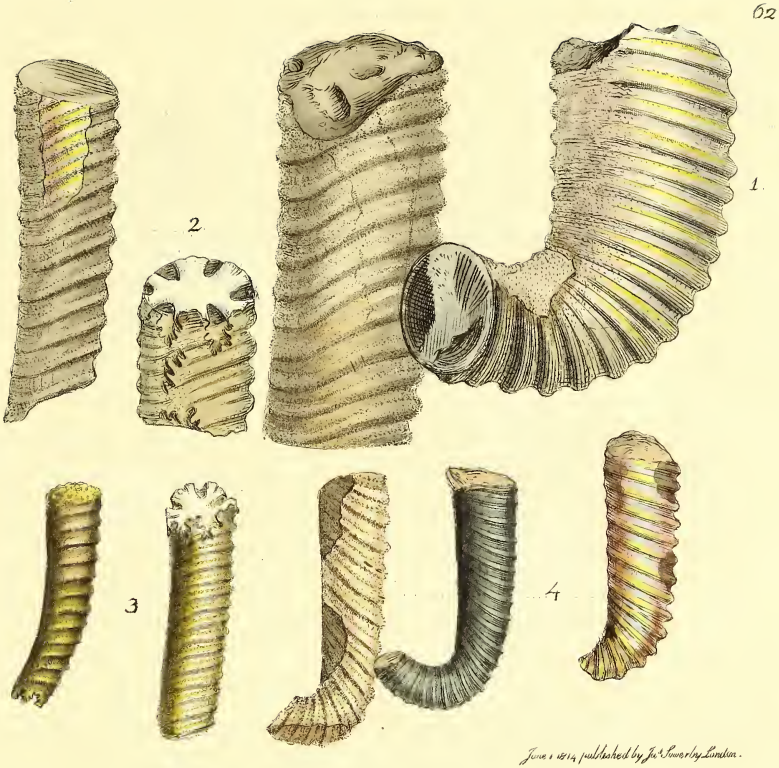
TAB. LXII.—*Fig.* 1.

SPEC. CHAR. Slightly depressed; undulations even, rounding, disappearing at the back; curvature gradual.

SYN. *Parkinson Org. Rem.* III. *Tab.* 10. *F.* 4.

AS the curved part of a shell of this nature, cannot be increased by age, I conceive this to be a very large species. Except the size, I do not know any very strong character by which to distinguish it.

This specimen is exceedingly handsome; the beautiful pearly shell covers a mixture of Pyrites and indurated marle, which serve to relieve it. Mr. Gibbs brought it with those of the last plate from near Folkstone.



June 1 1814 published by Jas Sowerby London.

HAMITES intermedius.

TAB. LXII.—*Figs.* 2, 3, *and* 4, *except the right hand figure.*

SPEC. CHAR. Depressed, undulations obtuse, annular, waved, curvature rounding.

SYN. *Parkinson Org. Rem.* III. *Tab.* 10. *F.* 1. 2. *narrow end uppermost.*

THE undulations continue all around, but in some specimens are obscure at the back; in size it is intermediate between H. maximus and H. rotundus or H. attenuatus; in form between H. maximus and H. gibbosus.

The three specimens at Fig. 2, and two at Fig. 4, are indurated marle; the smallest of these two last is harder and darker coloured, it approaches Argillaceous Iron stone. The Figs. 3 are Pyrites with a bright brassy surface, the straightest of these shows the pearly septa and siphuncle very distinctly. The undulations descend towards the front when near the curve, as in three of the smaller fragments, while further from it they are direct, and higher still they ascend as in the larger representations; all these directions are seen together in the longest piece of H. rotundus.

HAMITES gibbosus.

TAB. LXII.—*Fig.* 4, *right hand figure.*

SPEC. CHAR. Gibbous, undulations acute, prominent at the front, rather distant.

VERY flat at the back, where the undulations rise but little: the front is rounded, so that the end is an oval with the shortest diagonal from back to front, and just the reverse of all the others.

Indurated marle is the substance upon which the pearly coat of this is preserved; the septa are so much blended as to be nearly obliterated.

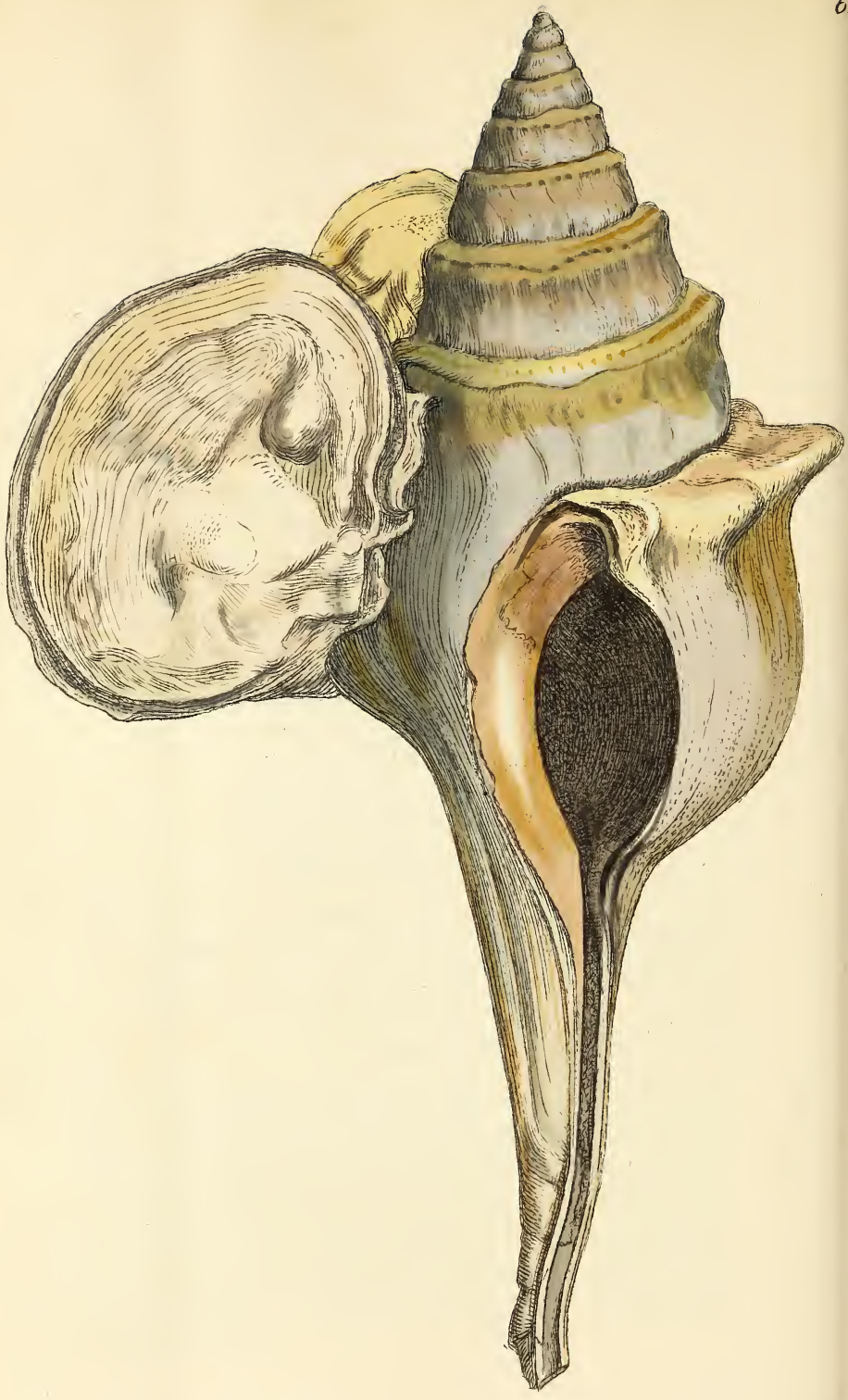
HAMITES adpressus.

TAB. LXI.—*Fig.* 6.

SPEC. CHAR. Aperture round, lesser limb acute, pressed close to the larger; no undulations; septa? distant, not waved.

UPON the surface, which is smooth and even, are circles that I suppose to be the edges of the septa, they are equally distant, notwithstanding the gradual diminution of the shell.

I can scarcely admit this as an Hamite, since it appears to want one or two of the characters, but am unwilling to make a new Genus without seeing more specimens with similar characters. The only one I have seen is composed of ochraceous Iron.



Aug.1.1814 published by Jas. Sowerby Londin.

FUSUS, *De Lamarcke.*

MUREX, *Linn.*

GEN. CHAR. Univalve spiral fusiform. Varicose sutures none. Mouth oval, with a long channelled beak and entire outer lip.

FUSUS longævus.

TAB. LXIII.

SPEC. CHAR. Ventricose, smooth, spire turretted with a few large knobs upon the upper part of the latter whorls; beak as long as the spire, slightly curved near the end.

SYN. Murex longævus. *Brander Foss. Hant. p. 22. f. 40. 70. and 93.*

WHEN young the knobs upon the latter whorls are scarcely discernable; when full grown they are about half an inch long, and about the same distance from each other; the length of the shell is eight inches, or even sometimes more; the young shells show transverse striæ upon the upper whorls.

This is one of the handsomest shells found at Barton or Hordwell Cliffs in Hampshire. I have figured an uncommonly perfect specimen from the cabinet of Miss Benett. Most of the specimens found are only fragments, and those approaching to perfection seldom have the beaks entire.

An Ostrea adheres to it, which, although pretty perfect, does not show its characters sufficiently to be figured otherwise than as a companion to the Fusus.

Miss Codrington has a fine specimen from Muddiford, in which the knobs are numerous and large; while I have fragments of various sizes in which there are scarcely any protuberances, thus constituting two varieties, which might lead to error, did not some specimens exhibit both in one shell.

There are shells from France, which often find a place in English Cabinets, and are perhaps this species; they are very delicately preserved, and show the striæ of growth in thready appearances, which are more or less decussated by transverse rising ridges from the first even to the last whorl. I do not know that this species, so frequent in Hampshire, has been found in the Highgate Clay.

OSTREA gigantea.

TAB. LXIV.

Spec. Char. Depressed, longer than wide, pit of the hinge large, tripartite, placed upon a straight perpendicular eminence, its sides flat striated; sides near the edge obscurely crenulated; muscular impressions deep.

Syn. Ostrea gigantea. *Brander, Foss. Hant. f.* 88.

The chief distinguishing mark of this oyster is the internal end of the hinge, which is perpendicular to the surface of the shell and straight not curved gradually into the sides of the shell, as in other species. The shell is thick and irregular in form.

I was favoured with this rare specimen by Miss Benett, who procured it from Hordwell or Barton Cliffs in 1813. It is the finest specimen, I believe, yet known, and appears to be the deeper valve. At the British Museum there is a fragment which I think seems to be the shallow valve of a size that may fit this, having about the same area and the hinge being similar: pieces more or less perfect are not unfrequent.

There are much larger oysters, recent and otherwise, but I am unwilling to alter the name. I picked up one brought to mend the road at Lambeth which weighed three pounds and an half, possibly from Malta, where there are oyster shells weighing much more; and I have an elongated one resembling Ostrea virginiana, *Lister*, Tab. 200, 201. Fig. 34 and 35, about one foot long.

It is worthy remark in this specimen that the colour of the cicatrix is so conspicuous.

Augt. 1814 published by Jas. Sowerby London.

VENUS angulata.

TAB. LXV.

SPEC. CHAR. Obtusely cordate, broader than long, beak short, an angular rising on the anterior side, which is slightly truncated, smooth; margin entire; larger hinge-teeth placed at an angle of about 60°.

Two inches and three-quarters long, three and a quarter wide, rather slender. The two prominent teeth of the hinge are placed at a curved* angle of about 60°. In the posterior side of the hinge of the shell is a rather roundish hollow to receive a tooth on the opposite valve.

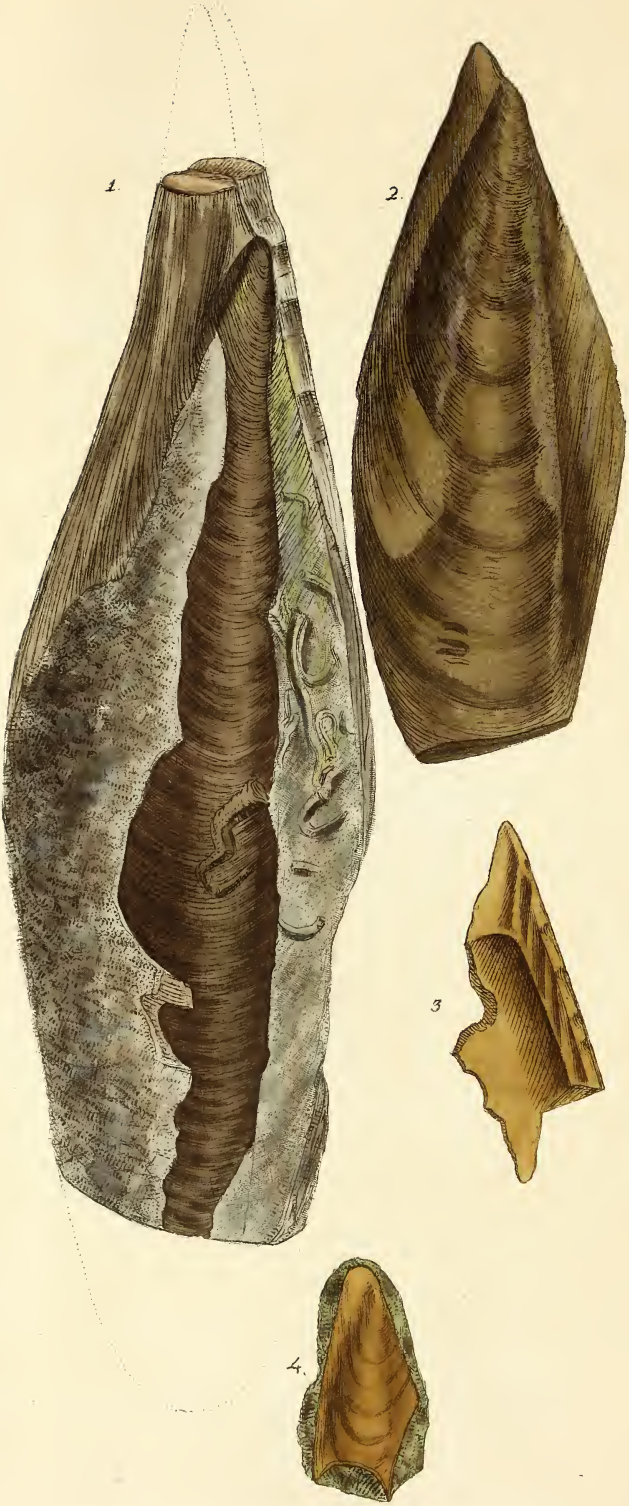
This shell very much resembles the recent Venus Islandica, but the hinge-teeth are much narrower, and the angle at the ridge is rather undulated and less conspicuous, and spreads more externally, but is better seen internally. It has some resemblance to Venus mercenaria, but that has a serrated edge. It may be proper to observe that in Mr. Pennant's British shells† this latter is mistaken for the former.

Desirous of determining this Blackdown siliceous Fossil, Mr. Parkinson kindly lent me a specimen much larger than the figure, by which, with a smaller one by favor of Miss

* Tab. 20. V. planus, angle not so curved. † Edition 4.

Hill, I am gratified in settling it, as I had figured what had, by some, been considered the same species.

I find, upon comparison, that there are two or three more that have a general resemblance to each other, found at Blackdown, which may be distinguished by the hinge, and I shall pay attention to them, that when I have sufficient specimens, they may not be forgotten.



Aug.1.1814 published by Jas. Sowerby London.

PERNA, *De Lamarcke, &c.*

GEN. CHAR. Subequivalved oblique winged bivalve, hinge formed of many parallel linear teeth, not articulating, and ranged upon a straight, transverse, or oblique line. Ligament attached between the teeth on each valve.

THE Genus Crenatula (Parkins. Org. Rem.) is somewhat related in respect to the crenulated hinge, but is otherwise very distinct. These will require further attention.

PERNA aviculoides.

TAB. LXVI.

SPEC. CHAR. Depressed, very oblique, ovato-lanceolate, wings small, beak straight; lines of growth fine, prominent, sharp.

LENGTH equal to thrice its breadth, the posterior wing is sharp; the hinge straight; anterior wing very obtuse, and the front round; sometimes six inches long.

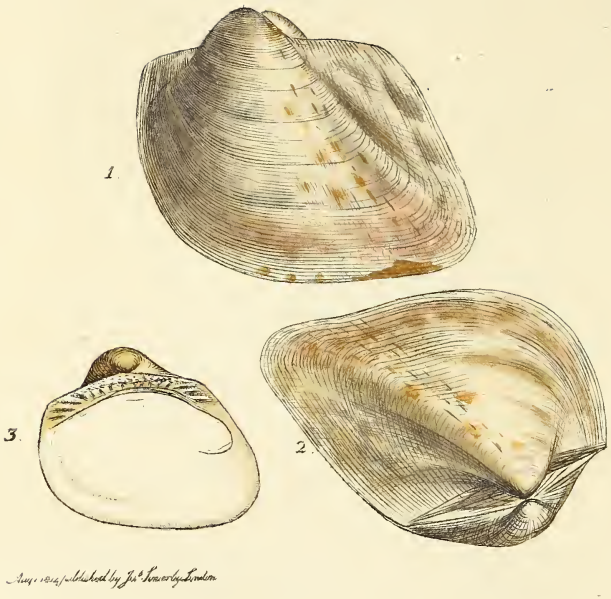
This species has been found frequently in various imperfect states of preservation, in which it has been difficult to gain proper instruction as to where to place it systematically, and although in its general construction it is sufficiently distinct, and its peculiarities convenient, as far as we know them, yet its generic and essential characters are concealed.

Dr. Lister, tab. 519, fig. 74, seems to have figured this shell in a mutilated state as a Solenites, and better specimens at tab. 522, and 523, fig. 77 and 78, as Pinnites, and many have called them in common Muscles. I do not know that tab. 521, Lister, belongs to this Genus; there is a peculiar accuracy in his figure from which I should doubt it, but tab. 522 being in all probability a Perna, I have an idea that they might have been placed on the same page as somewhat related to each other. In some places I understand a similar, if not the same species, has been termed the Laurel-leaf Muscle: in Oxfordshire, about Shotover Hill, I have picked up a curved inside cast which I expect may be of this Genus, and I feel an hope that it may be found with sufficient of the shell to determine it; we shall then know more accurately the form of the muscular impressions, which are very large and apparently one in each valve, besides a row of little lateral risings within the shell, near the front, that seem peculiar to it. Such are found in some of the Bedford Clay strata, but I have not seen very perfect ones.

Until Miss Benett brought me specimens, I had not much noticed the Genus, not having found any before sufficiently fit for attention, but on discovering the rudely crenated hinge, it shortly settled a distinction to search for, and soon after the learned Woodwardian Professor my very kind friend the Rev. John Hailstone, brought for my inspection some of the strata of Filey promontory, Whitenab, near Scarborough, with similar shells, one of which had the inner part of the hinge exposed, which was enough to show to what it belonged, and the general outline of the rest led me to Lister as above, tab. 519, fig. 74, from the inscription upon which plate, as Mr. Hailstone observes, "e rupibus juxta Philo, agri Eboracensis," we may suppose they came from the same place.

Figs. 1 and 2 are from Osmington near Weymouth, they were found in a mixed stratum with a muddy debris, and the shells seem as if they had suffered but little change by their general aspect, as if indeed they had only lain in mud and dirt so as to begin to lose a fresh appearance, such as might be expected in a few months, but as they are found upon examination to be changed into crystallized Carbonate of Iron? they are certainly preserved under other circumstances.

Fig. 3 shows part of an hinge from Whitenab. Fig. 4 is a specimen from the same place.



Aug.1 1814 published by Jas Sowerby London

CUCULLÆA, *De Lamarcke.*

Gen. Char. Bivalve equivalved, inequilateral, subtransverse, ventricose. Hinge rectilinear furnished with a series of transverse interlocking teeth, and terminated by two or three parallel transverse plates. Cartilage external.

This is another Genus separated from the Linnæan Genus Arca, and of which I presume we shall find many species.

CUCULLÆA glabra.

TAB. LXVII.

Spec. Char. Rhomboidal, anterior angle obtuse, posterior edge of the front rounded; surface covered by fine longitudinal lines decussated by the lines of growth: teeth of the hinge deeply striated.

Syn. Cucullæa glabra? *Park. Org. Rem.* 171.

But slightly ventricose, and without any very prominent angle; about one-fourth wider than long; beaks rather incurved; the surface to which the cartilage of the hinge is attached is marked with four diverging cuts, and the line of the hinge finely reticulated.

These Blackdown specimens, so much externally resembling some Arca of Linnæus, help to caution us against

forming a judgment from external appearances only. There are I find many species that might be taken for varieties, as they gradually pass through different degrees of obliquity. This appears to be the species Mr. Parkinson thinks might, if not otherwise designated, be called glabra; I am afraid however that there are still more glabrous ones to abtain the title. The line of the hinge is, as he observes, finely crenulated, as well as three transverse teeth which terminate the hinge at each end: so are some of the other species of this Genus, and possibly it ought to form part of the Generic Character, but may often be imperceptible from being worn, as I have it tolerably distinct in that Mr. P. thinks might be denominated C. decussata.

PRODUCTUS.

GEN. CHAR. An equilateral unequal-valved bivalve with a reflexed, more or less cylindrical, margin; hinge transverse, linear: beak imperforate*; one valve convex, the other flat or concave externally.

No one not usually conversant with the subject, would conceive the shells I have collected for this Genus could be in any way related to the Genus Anomia of Linnæus, but as yet there seemed no other place for them in the system, nor do they agree with any of the Genera established by later Authors. Martin has pointed out several divisions of the Genus Anomia; one of them which he defines to be "imperforate, with one valve gibbous, the other flat or concave, hinge on a straight line," includes these shells and I expect several others, as he considers the reflected margin to be accidental. His Conch. Anomites productus is a good type of the Genus, therefore, as the name Anomites must be laid aside, I have adopted his specific name as the Generic one, the character it expresses being also peculiar. It is highly gratifying to me that I have the means of showing so many new Species of such a curious Genus as this from Scotland, by the help of the indefatigable, ingenious, and zealous Friend to science, the Rev. John Fleming of Flisk; every one must feel pleased at his generous desire to facilitate knowledge by trusting such delicate specimens so far, and further at his desire to commemorate the late Mr. Martin, by naming this Genus after him, for his superior talent in showing the divisions in the old Genus Anomia, but as the name Productus appeared so applicable, I was loth not to use it, so have been content to apply his name to the species I have robbed of the Generic one.

* This term is used because it was formerly placed among Anomiæ, which included perforate and imperforate.

PRODUCTUS longispinus.

TAB. LXVIII.—*Fig.* 1.

SPEC. CHAR. Eared; convex valve indented in the middle, broader than long, the other concave; hinge long, one very long and several smaller spines near each side of the concave valve.

THE ears are triangular, gradually extended from the sides of the shell, and bounded at the back by the straight linear hinge, which is about half as long again as the shell, and equal to its width. All the spines are tubular, the two principal ones are nearly straight and cylindrical, attached to the sides of the convex valve, and extending in a line parallel to the hinge, the other spines are placed between these and the beak; in the only specimen I have examined there are two small holes near the front edge, probably the remains of spines which have been broken off. The reflexed margin is entirely lost, but the great curve of the concave valve and the blunt edge indicate it. Length half an inch.

I name this from its remarkable spines, of the extent of which when perfect I am not certain; they diminish but little in half an inch, so that to come to a point they would be perhaps an inch and an half long; they are apparently broken, which shows their tubular construction, and from what I have seen in other species, I should guess that they open into the shell for some purpose suited to the nature of its inhabitant. "It is from the great Limestone stratum which traverses in a northerly direction the county of Linlithgow, and constitutes a part of the independent Coal formation of the Lothians, Scotland;" Rev. J. Fleming.

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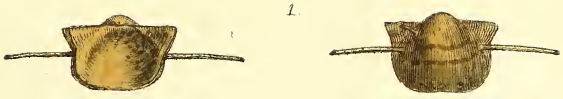

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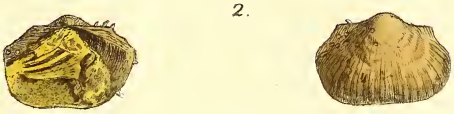

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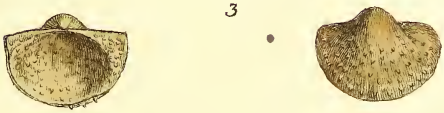

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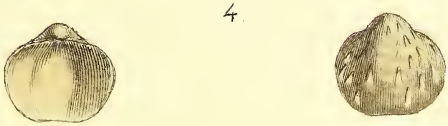

May 1814 published by J.S. Sowerby, London.

PRODUCTUS Flemingii.
TAB. LXVIII.—*Fig.* 2.

SPEC. CHAR. Ears small; shell nearly twice as broad as long; the sides of the convex valve gibbous; the front indented, longitudinally furrowed; a few short spines on the sides.

HINGE straight, in length about two-thirds the width of the shell; there are several concentric wrinkles extending over the ears, which are not very prominent; no lines of growth visible. The spines are tubular, as in others of the Genus, some are closed at their extremities, others open, perhaps broken. Length half an inch.

From the same place and by the same favour as the last; a specimen of the deep valve only, with some ferruginous earth in it, but which allows the inside of the shell to show the perforations. I believe that the deep shell may be enough to distinguish species by, but experience may hereafter determine it better. I take upon me to honour it with the name of the discoverer, whose merits and kindness I shall be glad to hand down to posterity.

PRODUCTUS spinulosus.
TAB. LXVIII.—*Fig.* 3.

SPEC. CHAR. Semicircular, flattish; hinge long and straight; convex valve gibbous towards the beak, with many small spines spread over it; ears obscure; the other valve also spinous and very concave.

THE spines are short, numerous, and arranged in quincunx order; besides these the surface is covered with longitudinal

striæ; the line of the hinge is as long as the shell is wide, forming the diameter of its semicircular edge.

From the same place and person as the last: this and the two former are extremely brittle; they are little else than the earthy part of the shell remaining, coloured by Iron Oxide.

PRODUCTUS aculeatus.

TAB. LXVIII.—*Fig.* 4.

Conchiliolithus (Anomites) aculeatus. *Mart. Petrif. Derb. T.* 37. *F.* 9 *and* 10.

Spec. Char. Roundish, concave valve smooth; the other with adpressed reflected spines; gibbous; front slightly indented; hinge half the breadth of the shell.

The spines are so adpressed to the convex valve, that they appear as if they were forcing their way through it and raising its surface, with their points towards the beak or backwards, chiefly on the sides, about ten on each, in nearly regular alternate order. Length rather less than the breadth, which is seldom three-quarters of an inch. On the convex valve are several obscure concentric undulations.

I had this from Mr. Martin; it is rather smaller than his figure, and is a cast in a light coloured Limestone with the shelly remains very thin. He says it is found near Bakewell and Buxton. The beaks, he observes, are often broken, giving them the appearance of being perforated. Mine is broken off, but I have represented it as if whole; the allowance is easily made.

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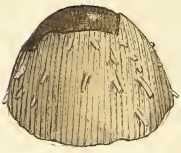

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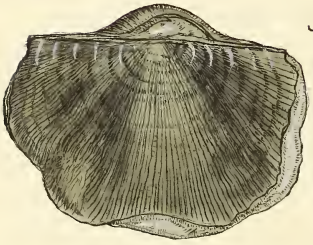
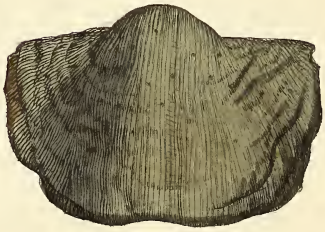




Oct 1 1814 published by Jas Lowerby London.

PRODUCTUS scabriculus.

TAB. LXIX.—*Fig.* 1.

Conchiliolithus (Anomites) scabriculus. *Mart. Petrif. Derb. Tab.* 36. *F.* 5.

Spec. Char. Nearly round, flat valve obscurely punctato-striated, the other gibbous, marked with longitudinal striæ and prominent tubercles ranged nearly in quincunx order; hinge straight, equal to the breadth of the shell.

The sides are straightish, giving the shell a rectangular form, rather wider than long: the tubercles on the convex valve are placed on the striæ, elongated, and each has a fine point at the end most distant from the beak. The flat valve has indentations like the impressions of the imperfect spines on the other valve, giving a concentrating reticulated appearance.

Mr. Martin sent me this shell many years ago from Buxton. It has much the character of his Conch. (Anom.) productus, and presuming on this general appearance, I expect most of the Genus, although not always found with the produced margin any more than his, have it when perfect.

PRODUCTUS spinosus.

TAB. LXIX.—*Fig.* 2.

Spec. Char. Roundish, very gibbous, convex valve with many long spines, longitudinally striated; hinge small.

The back of this shell is rounder than the front, which is slightly indented in the middle; the striæ are pretty numerous; the spines long, cylindrical, bent towards the front; hinge apparently much shorter than the shell is wide; length rather less than the width, which is not quite an inch. The concave valve is destitute of spines.

This being a rarity in Scotland, the same part from whence the Rev. J. Fleming sent me the former, I was glad to gain for the science the information such a specimen affords. Of its being a Productus I believe there can be no doubt, and its similarity to Conch. (Anom.) productus of Martin, Tab. 22. F. 1. upper part, which I wish to call Productus Martini, makes me almost suspect it to be a variety of it; the spines, however, being more prominent and the hinge shorter, may prove it distinct; we must avail ourselves of these characters until our knowledge is ripened by experience, and we may hereafter show more perfect specimens.

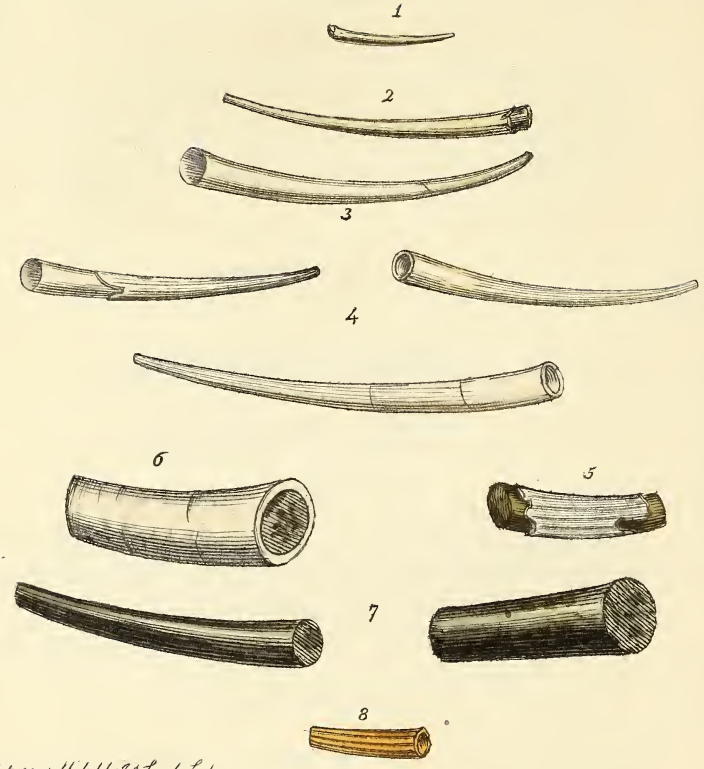
PRODUCTUS Scoticus.

TAB. LXIX.—*Fig.* 3.

Spec. Char. Semicircular, with fine longitudinal striæ and a few obsolete spines, gibbous towards the beak; sides expanded into the line of the hinge; hinge nearly twice the length of the shell.

The shallow valve has diverging striæ, similar to those in the other, but without spinous punctures; it is concave, deepest in the two spaces between the middle and sides; the sides wrinkled towards the hinge. The striæ on the convex valve are a little interrupted by obsolete spines or punctums, and short intervening striæ. The lines of growth are fine and partial, causing irregular undulations, especially towards the sides; the middle slightly depressed. Nearly two inches wide.

I know this species from Scotland only, it was sent me by the Rev. J. Fleming. It is in dark coloured foetid Limestone, like most of the Derbyshire species, and it has crystallized Carbonate of Lime of a lightish colour within it.



Oct. 1814 published by Jas. Storer & Sons London.

DENTALIUM, *Linn.*

GEN. CHAR. Shell univalve, tubular, tapering, slightly bowed, open at both ends.

DENTALIUM nitens.

TAB. LXX.—*Figs.* 1 *and* 2.

SPEC. CHAR. Nearly straight; surface even and shining; aperture circular; mouth expanded.

VERY gently tapering to the smaller end, at which the shell is thickest. From half an inch to one inch and an half long.

Found in the Clay at Highgate in 1811, chiefly in broken pieces, with some smaller ones, apparently young of the same; they were mostly filled with the Clay, and thin, brittle, tender, remarkably smooth and shining. I do not know that such have been found elsewhere in England. I have received a species resembling it, but rather larger, from Avignon, under the title Dentalium cylindricum, by favour of my kind friend Mr. Gerville; it is highly polished, but is distinguished by little oblong punctures.

DENTALIUM entalis?

TAB. LXX.—*Fig.* 3.

SPEC. CHAR. Slightly arched, surface waved, nearly smooth; edge of the mouth acute; apertures smooth.

SYN. Dentalium entalis? *Linn. Syst. nat. ed.* 13. *Tom.* 1. *p.* 3736.

ALTHOUGH this shell is tolerably smooth, the striæ of growth are here and there more or less conspicuous.

I have received specimens of this among shells from the Hordwell Cliffs; they do not vary much in size, and seem but little changed, which makes me rather doubt whether they really be fossil.

DENTALIUM striatum.

TAB. LXX.—*Fig.* 4.

SPEC. CHAR. Surface marked with ten or eleven longitudinal acute prominent striæ, and several obsolete intervening ones; lines of growth fine, numerous; aperture circular.

THE longitudinal striæ are very regular and prominent at the smaller end of the shell, making it about ten-angled, but they disappear towards the mouth; there are from one to four intervening minute striæ, which are most apparent near the middle of the shell. The thickness is nearly equal throughout, and the inside smooth; length about two inches.

I am rather doubtful whether this species, from its being sometimes nearly covered with longitudinal striæ, and sometimes nearly destitute of them, has not been made into two species, entalis and Elephantinus, by Brander; or it may otherwise have been deceiving, as the outer ornamented part is sometimes separated in a thin coat, leaving the other inner part nearly smooth; the figure shows the outer coat whiter, and the inner part smooth and not shining, otherwise it might have been considered as the Highgate species, from which it is however sufficiently distinct in other respects. I have received these by favour of Mrs. Tylee and the Rev. Mr. Bingley, from Hordwell and Barton Cliffs.

DENTALIUM decussatum.

TAB. LXX.—*Fig.* 5.

SPEC. CHAR. Surface marked with twenty or more longitudinal striæ and several intervening obscure ones; lines of growth numerous, distinct, oblique; mouth elliptical.

THE longitudinal striæ are much more numerous in this than in the last, but not much more prominent, although the shell is nearly twice the diameter; they are decussated by the lines of growth, the obliquity of which seem to indicate an elliptic mouth.

I received this specimen from the great Friend to Botany and science, William Borrer, Esq. from Sussex.

DENTALIUM ellipticum.

TAB. LXX.—*Figs.* 6 *and* 7.

SPEC. CHAR. Nearly straight, quickly tapering, rather compressed, surface uneven, aperture circular; external edge elliptical.

THE shell being thicker along two sides, gives the tube a depressed form, and makes the outer margin of the mouth elliptic; the lines of growth give the surface a rugged aspect; internally it is beautifully polished: the diameter of the mouth is sometimes nearly half an inch.

This is a large species, apparently not before noticed, for want of better specimens; it is however the more deserving

of notice as it gives rise to beautifully polished oblong cones, which frequently remain after the shell is decomposed, and which have often puzzled Collectors, from the difficulty of ascertaining what they belong to. They are from Folkstone in Kent, by favour of Mr. Gibbs.

DENTALIUM costatum.

TAB. LXX.—*Fig.* 8.

Spec. Char. Surface marked with twelve or more closely set ribs; lines of growth obscure; aperture circular.

The ribs and sulci between them are nearly equal and rounded.

I am greatly indebted to Mrs. Cobbold for sending me this rarity from the Holywell Craig, which place has afforded to ingenuity of enquiry and research such fine and instructive specimens, of which many are yet to come. It is but little changed, and seems like those shells that have been softened by exposure to the weather, then rolled a little, and afterwards preserved in Ochraceous Gravel. It does not agree with any recent species I know of.

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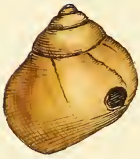
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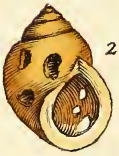
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Oct 1 1814 published by Jn.° Sowerby London.

TURBO.

GEN. CHAR. Shell conoidal or slightly turretted; aperture round, not toothed; margins disjoined in the upper part; columella smooth at the base.

TURBO littoreus.

TAB. LXXI.—*Fig.* 1.

SPEC. CHAR. Shell suboval, acute, striated; columnar margin flat.

SYN. Turbo littoreus. *Linn. Trans.* VIII. *p.* 158.

WHORLS about five, with their upper part rather flat, making the sides of the cone nearly straight; in the Fossil specimens the striæ are often worn away.

Bramerton Hill, near Norwich, affords these shells in plenty, and remarkably well preserved, sometimes even so as to vie with the recent ones in colour; there is some variety in shape, number of coloured stripes, &c. The upper figures are from a lengthened rather distorted specimen, such as I have often seen recent; the others are the more usual form of the recent specimens, which are often larger and vary much, as nice discrimination will discover.

TURBO rudis.

TAB. LXXI.—*Fig.* 2.

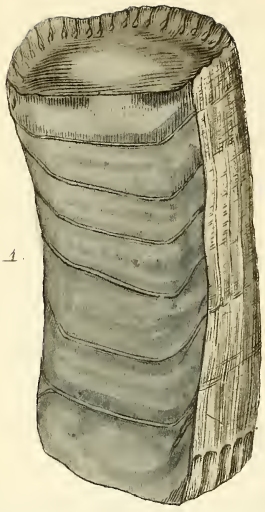
SPEC. CHAR. Shell suboval, rather obtuse; whorls ventricose.

SYN. Turbo rudis. *Linn. Trans.* VIII. *p.* 159.

WHORLS four or five, rather swelled in their upper parts, undulating the sides of the cone; the lip generally thick; there are often a few longitudinal furrows besides the striæ, which, with the irregular lines of growth, give the shell a rugged appearance.

From near Aldborough, by favour of my kind friend the Rev. J. Lambert, of Trinity College, Cambridge.

Whether I am right in considering these shells as the same species with the two recent ones I have named them from, must be determined by experience. I cannot discover any character to distinguish them by; the *littoreus* has the same markings, and the *rudis* seems to be as destitute of colour as the recent shells, a resemblance that is very remarkable, and seems to indicate that these fossils, together with others that accompany them, are not of very ancient date, compared with those that are in more solid rocks, and which also lie deeper in the strata.



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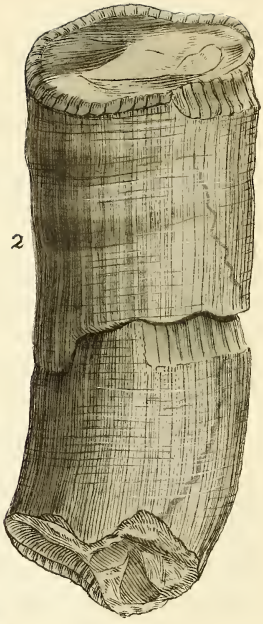

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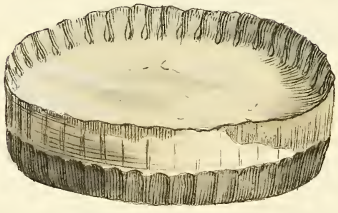

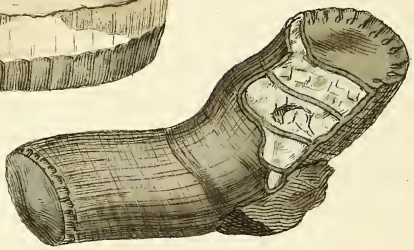

Oct 1 1814 published by J.s Lowerby Londres.

AMPLEXUS.

GEN. CHAR. Shell nearly cylindrical, divided into chambers by numerous transverse septa; septa embracing each other with their reflexed margins.

AMPLEXUS coralloides.

TAB. LXXII.

SPEC. CHAR. Tube irregularly bent, longitudinally striated; margins of the septa deeply reflexed and regularly plaited.

THE folds on the margin of the septa correspond in width to the longitudinal striæ of the tube, and are so deep as to form elongated cells opening into the chambers; the lines of growth are close and rather unequal in depth. The diameter and curvature of the tube are both irregular; the septa are a fourth or a fifth part the diameter, distant from each other, with the margins reflexed to the next septum. The diameter is from half an inch to one inch and an half.

This extraordinary production, an example of the curious structure of organic antediluvian remains, is from the Black rock at Limerick. I have been favoured with specimens by my ingenious friends Mr. Wright of Cork, and Mr. Moore of Dublin. They seem a type of a peculiar formation or æra in that Limestone, which requires some penetrating research. Its resemblance to a Coral or Madrepore has probably caused it to be less noticed, as looking like ordinary specimens of branches of some of that tribe. Upon examining it, however, its uncommon structure is developed, and we are enabled to add another Genus to the multilocular shells.

Fig. 1 shows the half of a cylinder with the divisions, which are filled almost homogeneously, so as to appear a mere piece of grey marble, the upper end exposing the embracing margin of a division in oblong convexities, between the angles of which are small remains of the corresponding folds of the next joints; at the bottom are the concave sides of the folded margin, the lower corners of which are generally left in the angles of the plaits below. Fig. 2 is turned the other way upwards, and shows its irregular cylinder, striæ, &c. Fig. 3 a single joint of a larger specimen, with part of the shelly covering left; Fig. 4 two joints of a smaller specimen broken from No. 5, which exposes crystallized Carbonate of Lime in some of the chambers.

Oct.1 1814 published by Jas. Sowerby London.

AMMONITES planicosta.

TAB. LXXIII.

Spec. Char. Depressed, volutions six or more, not concealed; (diverging costæ) or radii numerous, obtuse, flatted at the front; mouth circular, slightly indentated at the back by the preceding whorl.

Between the rising striæ of this shell are rounded furrows; the costæ are prominent on the sides and straight, as they go round the front they widen, are flatted, and incline towards the mouth. The siphunculus is only now and then preserved so as to be discernible.

I have long desired to acknowledge the kindness of John Rogers, Esq. of Yarlington in favouring me with two beautiful drawings of this fossil, commonly known by the name of Marston Stone. It is found at Marston magna near Ilchester; at Evershot in Somersetshire; in digging a well in Lord Digby's park at Sherborne; and also near Yeovil in Somersetshire in moderate masses, occasionally big enough to form tolerable sized sideboards; Dr. Lettsom has a very fine one. It is formed of a dark marly Limestone, including shells laying in great disorder, and much variety is produced by the sections when cut and polished, the white shelly remains passing into a buff colour, and sometimes finely iridescent both inside and out. The divisions of the chambers lined or filled up with fine brown

crystallized Carbonate of Iron or Carbonate of Lime, adds to its variety and beauty. The same species of shell is discovered at other places under different circumstances. My good friend, James Brodie, Esq. brought me specimens from Craymouth in a more granular marly Limestone, in which nearly the whole of the shelly part is more or less replaced by a brown sparry crystallization exactly forming the contour of the shell. They are also found loose and very perfect, and sometimes in small masses or separate, cast in Pyrites, as at Exmouth. There are seldom other shells in this congeries besides the one now described, and a keeled Ammonite generally of a larger size and sufficiently characterized to form another Genus perhaps, hereafter to be noticed.

TURRILITES tuberculata.

TAB. LXXIV.

Spec. Char. Whorls of the spire beset with one row of large obtusely-conical projections or tubercles, and three rows of smaller tubercles below them.

The upper row of tubercles extends along the middle part of each whorl; they are in number about eight or ten to each whorl, and placed at distances nearly equal to their diameter. The siphuncle (mention of which is omitted in the Generic Character on page 81, on account of uncertainty) is placed near the upper part of the whorls.

Who would have imagined, but a short time since, that Great Britain could possibly have been favoured with such a variety of natural productions as are now continually discovered. The present specimen among others, in this work only, is a proof of an increasing activity of research. We have been able to pourtray this magnificent shell through the kindness of the assiduous G. A. Mantell, Esq. F. L. S. accompanied with the observations of locality at the end of this description; it is not only valuable as a shell of rare occurrence, but from its extraordinary size, for if perfect it must have measured more than two feet in length, according in proportion with the gigantic species of Ammonites, a Genus to which it is analogous in its chambered structure.

This specimen is decisive of the situation of the siphunculus in the Turrilites, which before was in a similar predicament with some of the Ammonites and the Hamites, see p. 135. It is perhaps wonderful that the replacing of the different parts of the construction should be so partial, that the siphuncle can be discovered only in a very few instances: there are among Fossils many other examples of the same nature. The probable construction of the septa with the siphuncle is similar to that of Hamites, and from my experience in this subject, I think Montfort's figure with a central siphuncle is incorrect, both in Turrilites and Baculites. The specimen here figured is a little compressed, being narrower one way than the other; it was found in July, 1814, in the marle stratum at Middlesham, in the Parish of Ringmer in Sussex, situated about two feet below the surface; the Turrilites occurring in general at the depth of six or seven feet.

It is worthy of remark that this is the only species found at Ringmer and Stoneham, while at Hamsey, where the costata, figured at Tab. 36, and the undulata, Tab. 75, are met with, the tuberculata entirely disappears.

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TURRILITES undulata.

TAB. LXXV.—*Figs.* 1, 2, *and* 3.

SPEC. CHAR. Whorls decorated with many gently undulated costæ, mostly continuing from the upper to the lower part of each.

THERE are sometimes indications of a row of tubercles below the costæ, and sometimes the costæ themselves are somewhat depressed near the middle, as if they were dividing into knobs. Some persons doubt whether this be not a variety of Turrilites costatus, Tab. 36, I, however, consider it deserving of a distinct figure, and I have received, since this plate was engraved, some specimens which serve in some measure to confirm me in my opinion of these being distinct species, as they agree on the whole with the larger outline, Fig. 1, which shows they are sometimes of a considerable size, and the more finished representation, Fig. 2, with very little depression in the costæ. Fig. 3 shows a variety somewhat approaching the costata, but even in this there is but one row of tubercles, and that would be concealed by the next whorl.

This species is found at Hamsey with the T. costata, while T. tuberculata seems only to belong to Ringmer. As it requires some time to be assured whether one I have received from Stoneham is not another distinct species, having one row of larger and two of smaller tubercles, while T. tuberculata has one row of larger and *three* of

smaller tubercles (besides other differences), I have reserved it for a future period, when other species may have been discovered. These figures are from specimens with which I am favoured by Mr. Mantell, who has examined the Genus much.

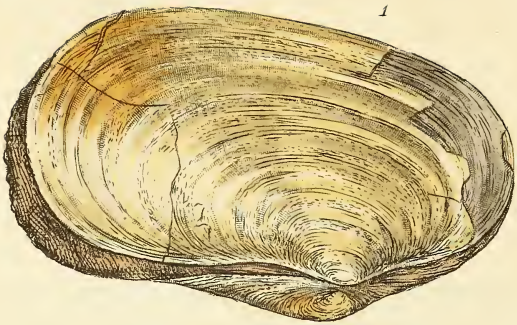
TURRILITES obliqua.

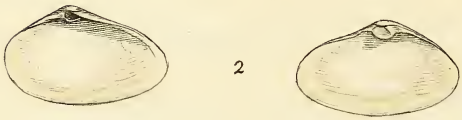
TAB. LXXV.—*Fig.* 4.

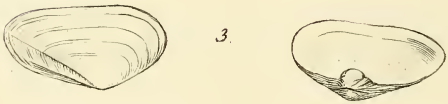
SPEC. CHAR. Upper part of the whorls contracted; below the middle is placed a row of large oblique tubercles.

THE spire of this turns to the right, whereas the other Turrilites are reversed shells: the tubercles being placed upon the more prominent part of the whorls give them an angular aspect.

The morsel I have here figured is from the micaceous Sandstone near Devizes: it was found in digging the Canal, and presented to me by Mrs. Gent. It may hereafter prove not to be a Turrilite: I figure it not knowing that better can be got, and wishing to draw the attention of Collectors to it. Its not being a reversed shell is peculiar, if it be a Turrilite, as I believe other Turrilites always are so, a circumstance which Mr. Parkinson's Engraver has overlooked, and which I forgot to mention in my former description, though my figures are right.







J.H.E.14

MYA intermedia

TAB. LXXVI.—*Fig.* 1.

Spec. Char. Depressed, smooth, twice as wide as long, sides rounded, anterior side expanded, gaping a little; posterior side small; front nearly straight.

The opening of the gaping side is less extravagant than in most Mya; the general flatness of the shell, but particularly of the anterior side, distinguish this in its external appearance from several fresh-water shells of the Genus Mya of *Linn.* or Unio of De Lamarcke and others. The specimens in general are about two inches and an half wide. I was favoured with some by Lady Wilson, as well as by Mr. Borrer from Bognor. I venture to consider it a Mya, but I could not see the hinge with so much certainty as I could wish, although I had many specimens, as the valves are generally closed and held strongly together by the tough sandy marle.

The shell is a little chalky, but breaks in some parts with a brittle and angular fracture.

MYA plana.

TAB. LXXVI.—*Fig.* 2.

Spec. Char. Rather depressed, smooth, wider than long, ovate, nearly equilateral; anterior side rather elongated; front rounded.

This is a very delicate, slender shell; the anterior side scarcely gapes, but is slightly truncated only: about three-fourths of an inch wide.

I found this abundantly at Plumsted, near Woolwich in Kent, in 1808, yet very rarely a moderate specimen, and seldomer in pairs; they are placed in a stratum of shelly earthy matter seldom more than a foot thick, betwixt sand and flint pebbles, varying very much in size, and stratified above and below them. The shells are more or less stained, a little chalky, partly retaining their polish within, and separating easily from the earthy substance about them.

MYA subangulata.

TAB. LXXVI.—*Fig.* 3.

SPEC. CHAR. Rather depressed, smooth, wider than long, nearly equilateral, oblong-ovate; anterior side angular above, acuminated; front slightly emarginate.

THE greater width in proportion to the length; the straighter and slightly indented front, and angular appearance of the anterior side, distinguish this shell from the last.

From Barton, by favour of Miss Tylee. I believe it is very rarely found, yet the specimens are tolerably perfect, being cleaner and whiter than the last, and retaining the inside polish. I suspect this species gapes but little or not at all, yet the hinge does not allow of its being separated from the Mya, else the general construction might warrant it, as in external character it differs from fig. 1, which is the more common appearance of Mya.

PLAGIOSTOMA.

PECTEN, *Luid.*

GEN. CHAR. An oblique eared bivalve, hinge destitute of teeth or internal pit; line of the hinge straight in one valve, in the other deeply cut by an angular sinus.

THE beak and parts about the beak of all the individuals of this Genus I have met with, are very thin; the sinus at the back forms when the valves are together a large triangular aperture, probably for the passage for the attachment of the animal to rocks, &c. There does not appear to be any true hinge. The type of this Genus has been well known from Luid's time to the present day, and has had many Generic titles, such as Pectinites, Venus, Cockle-stones, &c. it is figured among the Trigoniæ in the Natural History part of the French Encyclopædia; and Parkinson, after he had taken much pains, thought he had found a tooth in the hinge, and figured it as a Donax, *Org. Rem. 3.* t. *13.* f. *3.*

It often happens that certain species of a Genus are preserved in hard stone, or under circumstances that prevent our getting at those parts which are required to establish Generic characters, while others are as easily examined: this is exemplified in the shells of this Genus, the P. gigantea, although too tender to resist the changes which the thick valves of several of the Trigonia will withstand, is nevertheless generally well preserved, but so firmly attached internally to hard stone that the inside is not to be got at, whereas the P. spinosa often occurs in soft chalk which can be picked out

easily; in this, however, the thinness of the beak is such, that it is not often preserved entire. Plagiostoma (from πλαγιος, oblique, and δομα, mouth) is the trivial name given by Luid to my gigantea, from which it should appear that he had not overlooked the external form of the back, with the triangular opening for the cartilage of attachment. The species of this Genus being apparently but little understood, I have taken some pains to examine them, and the tenderness of the beak or hinge end, which is extremely thin and brittle, and commonly imperfect, rendering this difficult, I am the more pleased that I have thus succeeded.

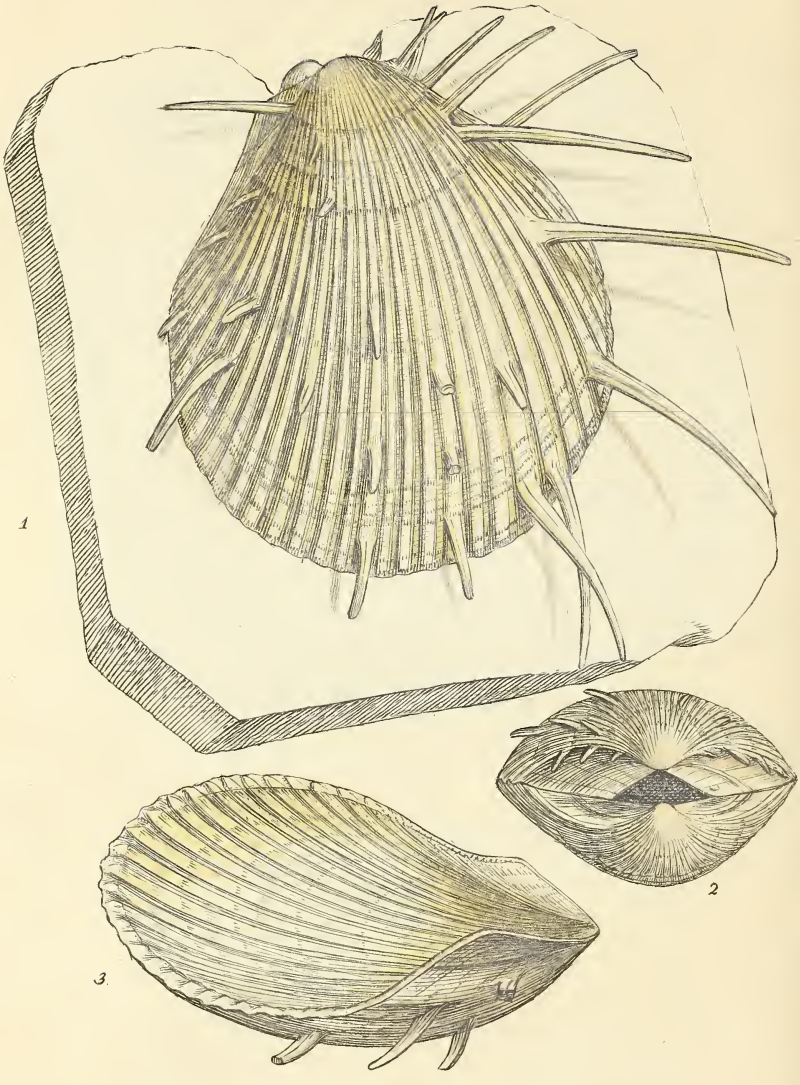
PLAGIOSTOMA gigantea.
TAB. LXXVII.

SPEC. CHAR. Smooth, depressed, deltoid with the posterior side rounded into the front; ears small, anterior one longest, placed in a large broad and straight furrow; beaks pointed; surface obscurely marked with diverging striæ.

ALTHOUGH this shell is marked with lines of growth and diverging striæ, yet its general aspect is smooth; often the lines are very obscure, as if worn away, and the surface appears polished: it is deepest towards the straight anterior side; its width is about four-fifths of its length, and its greatest depth about one-fifth.

This species is found in great variety in the Bath Lyas or Foetid Limestone, both the blue and white, the specimens partake of the colour of the stone in which they are imbedded. They are often of large dimensions: I have one nine inches in diameter, and another very large one

J.S 1814.



J. Sowerby London 1814.

from Avignon, where they are said to be sometimes larger, even ten inches or more. Probably they are as large in England in places from whence I have received only smaller specimens, as Cardiff Castle, and Pickeridge Hill, in South Wales, from which latter place I have received abundance and variety by favour of Miss E. Hill, who first noticed those interesting quarries, being conducted there by an observing mind, upon seeing the stony fragments brought to the road side from Boston House, and finding upon enquiry that it was built of stone brought from that place about 250 years since. Several new and curious productions are found these deserving the attention of the Geologist, as to the strata, &c. Among them are a variety of Gryphites and flattened Ammonites, in what the workmen called Blue and Grey Lyas; there are even fragments of Pentacrini, Echinus spines, &c. and it may be worthy of remark that the striated Limestone, Brit. Min. tab. 345, is found there much as at Shotover.

PLAGIOSTOMA spinosa.

TAB. LXXVIII.

Spec. Char. Obovate, longitudinally furrowed; sides nearly equal, straightish; one valve spinous, spines half the length of the shell.

One valve is more convex than the other, the flatter one being spinous; both are deeply and regularly furrowed both outside and within, the projections of the inside terminate in angular teeth near the edge. The spines, in

number about twenty-five, are largest near the front of the shell; at the sides they are smaller and lie closer together: each spine has a dorsal ridge and a distinct furrow beneath. Beaks projecting. The whole surface of the shell is covered with very fine transverse projecting striæ; the lines of growth sometimes interrupt the regularity of the furrows, and the spines are sometimes very short and adpressed, at others they are irregularly bent, but their general position is at an angle of about 45° with the shell. The breadth is rather above two-thirds of the length. I can discover no muscular impression within the shell, although I have specimens perfectly cleared from the chalk.

This species is common both in the soft and hard Chalk, and is often attached to Flints. I have received it in hard Chalk from Mr. Mantell, found near Lewes; from Norton Bevant, Heytesbury, &c. from Miss Benett. Inside casts are common in gravel flints, these, of course, do not expose the spines. Mrs. Morris sent me a specimen picked up at Rickmansworth, and I have a cast in Calcedony, found near Sidmouth, for the possession of which I am indebted to the kindness of my friend Mr. Thomas. Its varieties are almost, nay sometimes quite, destitute of spines; Mr. Mantell sent me a specimen from Lewes, in which some of the spines are almost at right angles to the shell, and the others laying in bas-relief, curving in elegant turns, as if too weak to rise.

Fig. 1 represents the spinous side of a specimen said to be from Brighton, the Chalk is cut from it as far as might be to leave support to the spines; the beak of the plain side is just visible. Fig. 2 gives the dorsal view of a specimen from Northfleet, showing the triangular aperture: this specimen had the remains of a Flustra on some parts of it. Fig. 3 the inside of a detached spinous valve, having no appearance of a muscular impression, as in Pecten.

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DENTALIUM planum.

TAB. LXXIX.—*Fig.* 1.

SPEC. CHAR. Gently tapering and curving, smooth; aperture round; lip a little thickened, sharp edged.

NEARLY an inch long, sharp at the smaller end.

Gregarious, found in moderate quantities in a greenish sandy Limestone at Bognor, in masses of considerable size. I have a piece about four inches broad, and uniformly filled with them as the piece represented, by favour of Mr. Boys.

DENTALIUM cylindricum.

TAB. LXXIX.—*Fig.* 2.

SPEC. CHAR. Cylindrical or scarcely tapering, nearly straight, smooth; aperture round.

ABOUT three-fourths of an inch long, and almost a line in diameter; the smaller end nearly as large as the other.

The ochraceous sandy Iron-stone stratum near Exmouth, affords these in tolerable plenty, being casts of both the outsides and insides of the shells, leaving the empty spaces where the shells had been. The casts of the inside look

like perfect Dentalia, more especially when separated or having fallen out, and may often be taken for the shells themselves. I received these long since by favour of the late Mr. Cunnington, and lately by the friendship of Mr. Holloway.

Dr. Thompson, in his Annals of Philosophy, asks how the Fluor was dissolved from the Quartz in some Mineral veins; and may I not here ask what has become of the Carbonate of Lime or shelly matter? What solvent would take away the Lime and leave the cavities where the shells were, so perfectly clean, and apparently having no avenue for its escape? I have still more curious facts of this kind; they serve to enliven the imagination, and heighten our admiration of Nature.

DENTALIUM incrassatum.

TAB. LXXIX.—*Figs.* 3 *and* 4.

Spec. Char. Very taper, curved, smooth, swelled near the aperture; aperture round; lip sharp.

Similar in its proportions to D. planum, but much more swelled near the lip, and more curved.

Found in single specimens, or in numbers clustered together, as fig. 3, in hardened Clay at Highgate. Fig. 4 is a specimen of the same species with part of a small one at the small end, giving it the character of a jointed species: found in the dark Clay at Richmond, where the specimens were generally scattered.

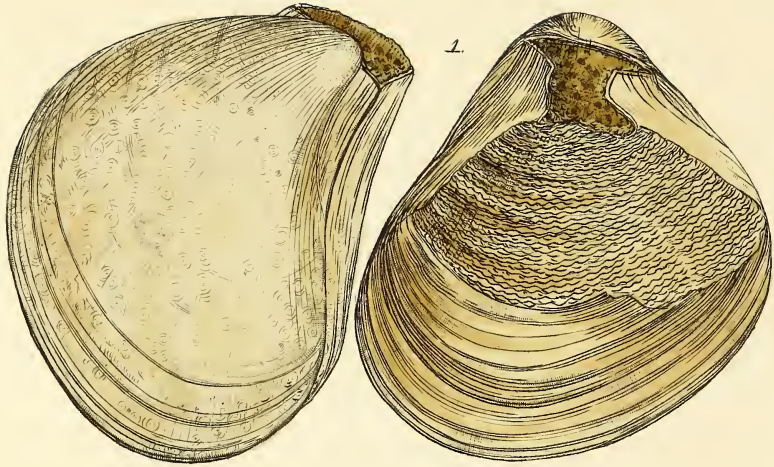
DENTALIUM medium.

TAB. LXXIX.—*Fig.* 5.

Spec. Char. Shell tapering; mouth round; lip sharp; tube somewhat trumpet-formed within, or broad at the mouth, and becoming suddenly small; external transverse striæ or lines of growth conspicuous.

This shell is rather thicker than most of the species, it is gradually thinner near the mouth, the edge of which is sharp, giving the inside a trumpet form, while the outside is not expanded.

I am obliged to the indefatigable Miss E. Hill for this, among other curiosities peculiar to the green sand from Blackdown; and as I believe it to be rare, I have placed it here that it may be an hint to those who have opportunity to search for better specimens; it is part of a cast in sand, which is united together by a siliceous cement. Fig. 5 shows the cast of the inside; fig. 6 the cast of half the outside broken from the other.



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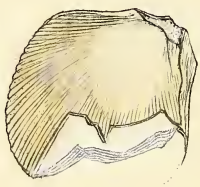


2.

DIANCHORA.

Gen. Char. An attached inequivalved bivalve, the attached valve having an opening in place of a beak, the other beaked and eared; hinge without teeth.

Although I expect there are but few shells with these characters, I think the attached valve of importance enough to separate them as a distinct Genus from Plagiostoma, which in other respects they closely resemble. This character is the more remarkable, as it is united with an angular aperture at the back of the shell, seemingly formed for the passage of a ligament, by which the animal could fix itself to rocks, &c. as in Plagiostoma. The beak and parts around it are mostly very thin, the ears small, and the general contour of the shell oblique.

DIANCHORA striata.

TAB. LXXX.—*Fig.* 1.

Spec. Char. Oblique, ovate-triangular, beak prominent, free valve obscurely ribbed.

Length and breadth nearly equal, and the form would be ovate, were it not for the projecting beak, from which the free valve is gradually flattened to a sharp edge, and which

gives it a triangular aspect. The ears are small and continued along the sides.

I found this some years since at Chute Farm near Warminster, in the green sand, a place that afforded me an extraordinary variety on a small piece of land. The specimens vary a little, and have more or less Carbonate of Lime in them, filling up betwixt the calcedonic infiltration, which looks like a little worm shell or Serpula, but on inspection discovers a sort of stalagmitical form of the calcedony in circles, rings, or drops.

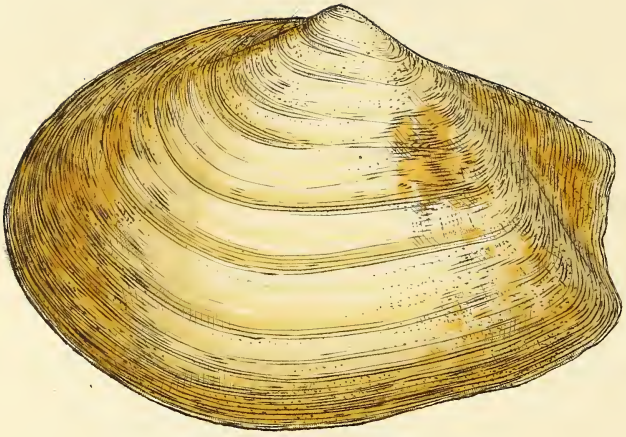
DIANCHORA lata.

TAB. LXXX.—*Fig.* 2.

Spec. Char. Semicircular, beak rising; free valve plain.

The obliquity of this species is scarcely to be observed; the lines of growth being slightly marked, and the gentle convexity of its form, added to the indistinctness of the few striæ upon its surface, and the sharpness of its edge, give it a peculiar plainness of character.

This is from the Chalk near Lewes, by favour of Mr. Mantell; it is but little known, I believe, at present in Chalk, and it differs from any I have hitherto seen in other strata or formations.



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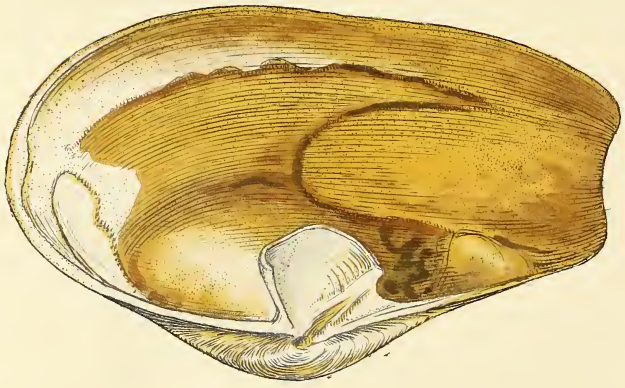


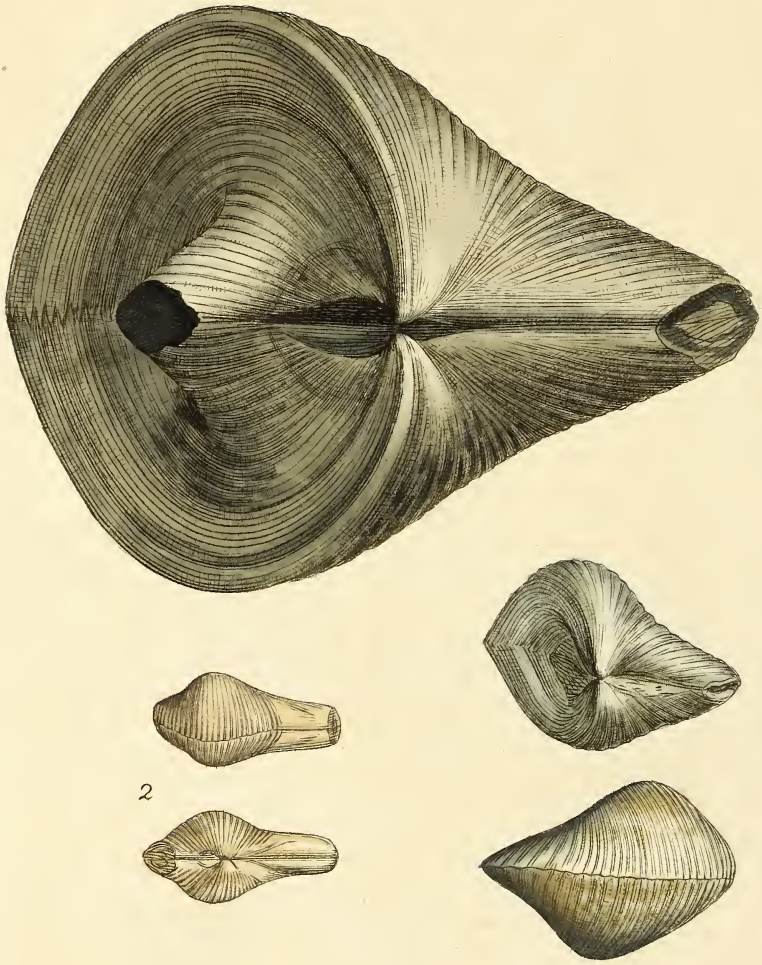
MYA lata.

TAB. LXXXI.

Spec. Char. Ovate, depressed; anterior side acuminated and truncated, slightly gaping.

Length about two-thirds the width; the beak is sharp, but not very prominent; the hinge-tooth large.

This is a great curiosity at present, and is highly satisfactory as determining the species to be different from the recent Mya arenaria of Linnæus, which is readily seen by comparison, at least from that understood to be Mya arenaria in England. The craig shells of Norfolk and Suffolk are remarkable for the little change they have undergone, as well as their near resemblance to some of our recent species; and although a few are not easily to be distinguished from them, and others are mutilated, and until seen in perfection cannot be distinguished, yet many are not at all related to any recent species known or observed in any other stratum. Thus it is pleasant to meet with sufficient specimens. If the present be the same as those from Bramerton near Norwich (of which we have only seen small pieces which were generally considered as Mya arenaria) they must be different species; Mya arenaria is not truncated, and they differ sufficiently from Mya truncata not to be that species, and as it is a broad shell, I have called it lata. It seems to be between Mya arenaria and truncata; but there are other truncated species among the Fossils, and others might come between the same two, else intermedia might have been a good name.



2

CARDIUM hibernicum.

TAB. LXXXII.—*Figs.* 1 *and* 2.

SPEC. CHAR. Very broad and deep, longitudinally striated; posterior side deeply truncated, bounded by a large circular ridge, concave, with a nearly central umbo; anterior side elongated. Beaks incurved, small.

THE length of this is nearly equal to the width, and the depth but little less than the length. The size and sharpness of the longitudinal ridge that bounds the concave posterior side, is such as to give the shell a carinated form; it arises from the beaks; the umbo in the centre of this side is a kind of wing. The striæ on the surface are rather distant, and the spaces between them convex, but not enough so to be called ribs.

The Genus Cardium is so constant in its characters that it can seldom be mistaken; its species may generally be known by analogy, although the internal parts cannot be seen; the present one, however, without a knowledge or comparison with a recent species as unlike others of the Genus as itself, might have remained unintelligible, but with such an help we are enabled to be bold, and undoubting: the Venus's heart Cockle, Cardium cardissa, has the internal characters very decisive, and the remarkably curious external form is nearly the same as that of the stony cast, except that the sides or wings, if I may be allowed to call them so, are not so much elongated. It is with much pleasure I thank my Friends, Dr. Wood and S. Wright, Esq. of Cork, for specimens from the black marble rock in that vicinity. Mr. J. Humphreys has materially assisted me with specimens, and I have had one from Mr. W. Moore of Cork, who considered it as the heart Cockle. They are provincially called *Asses' hoofs*, and I am told they are sometimes so large as to answer to the appellation in respect of their size. The Cardium found in the neighbourhood of Paris, by Lamarcke, is quite distinct, and more like C. cardissa, ours not having the denticulated edges: may their

existence depend on the neat preservation of the specimens, being chiefly in a stratum of little else than clean fragments and minute shells of their own texture, which preserve them by defending them from the ruder fragments and change of weather?

As the sides are usually broken off, I have had recourse to several specimens to produce the upper figure, which I hope exhibits the character tolerably correct. The shell is so incorporated with the stone, that it is not possible to detach it and expose the hinge: it is often partially filled with foliated Carbonate of Lime, exhibiting the diagonal fracture. Fig. 2 gives two views of a specimen that appears to have been distorted when the rock was in such a soft state as to assimilate with the shell, and both were compressed or bent together, a circumstance characteristic of the Irish Black Rock.

CARDIUM elongatum.

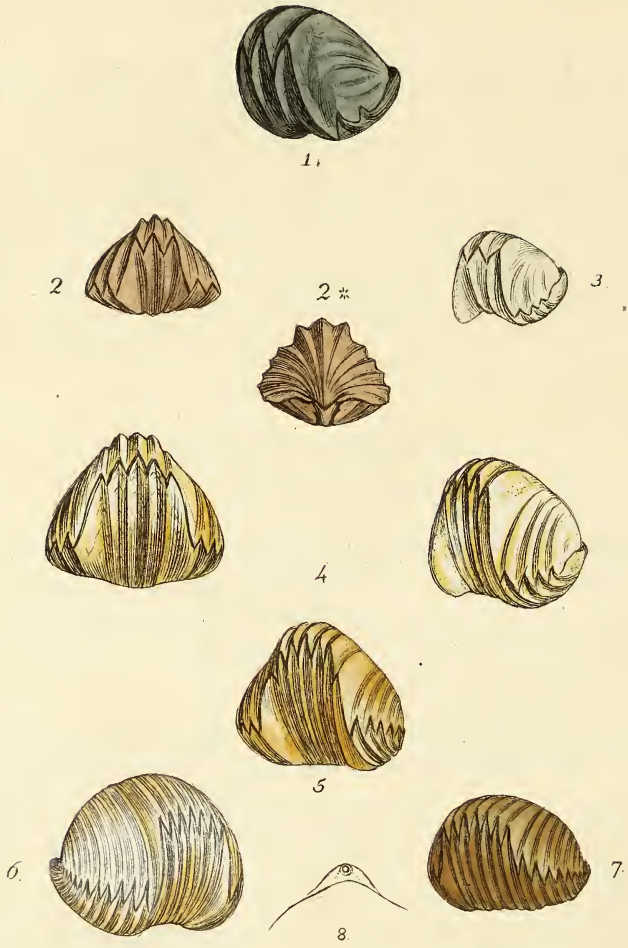
TAB. LXXXII.—*Fig.* 3.

Spec. Char. Ovate, ventricose, longitudinally and obtusely plaited; anterior side elongated, plain; posterior side produced.

Syn. Arcites rostratus. *Mart. Petr. Derb. pl.* 44.

Including the elongated sides, this shell is twice as wide as long; the longer side is nearly cylindrical and free from striæ; the beaks are rounded.

This is from Derbyshire, and is the same species as figured by our late friend Mr. Martyn as an Arca, which it was generally thought to resemble. Its relation to the Genus Cardium will not, however, now be doubted, having seen the Cardium hibernicum. How near the rock containing this in Derbyshire is related to the black rock of Ireland, will by degrees be ascertained. Some of the Terebratulæ which accompany them are very similar, if not exactly alike in both rocks, agreeing with Anomia striata of Martyn. This specimen was among others presented to me by Mr. Martyn before he begun his work, and I presume it is from the place where his specimen was found.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Terebratulæ of the plaited sort seem to form a division, but in the great variety of species the passage from the smooth to the plaited ones will be so gradual, that it will be hardly possible to draw a line. I have put a few plaited ones together here, and once thought they might be named numerically from the ridges, but I now expect that will be equally difficult. I have taken such means as were most convenient for the present, hereafter perhaps we may improve. The species here represented and those figured in tab. 15, agree in many particulars: the perforation in both is at the end of the beak of the shallow valve, and occasionally they have both two oblique sulci or narrow furrows, that would if imperfect imply a triangular foramen, see fig. 8; the sides of the hinge are not straight in either. Fig. 2* shows the cast of the triangular organization; I shall explain this further when I figure species in which I have seen the internal structure.

TEREBRATULA lateralis.

TAB. LXXXIII.—*Fig.* 1.

Spec. Char. Oval, broader than long, gibbous; middle of the front much elevated with three deep but short plaits; sides with two plaits each, much below the middle.

The three plaits in the middle of the imperforated valve, though not continued far into the shell, produce three very

deep angular notches, which are filled by as many sharp teeth on the edge of the other valve, which is not so much plaited and is altogether flatter. The length of the edge between the central plaits and the lateral ones is remarkable.

This is found in the Limestone rock near Dublin, and in the Black rock near Cork. The stone is generally a compact darkish marble, fœtid when scraped. I have had specimens from Messrs. Moore of Dublin, and Dr. Wood and Mr. Wright of Cork. A similar species is found at Aynhoe, Northamptonshire, in a marly stratum.

TEREBRATULA crumena.

TAB. LXXXIII.—*Figs. 2, 2*, and 3.*

Spec. Char. Deltoid, gibbous, plaited; middle of the front elevated with three long plaits; sides with four or more plaits below the middle; beak prominent.

Syn. Anomites crumena. *Martyn Petr. Derb. Tab.* 13. *f.* 4.

This species is distinguished from the last by its deltoid form, and the plaits extending nearly to the beak.

Mr. Martyn long since sent me this from Winster, it is composed of grey Limestone. I have also casts in ferruginous Sandstone, of what I suppose to be the same species, from the banks of the Tees, by favour of the Rev. Mr. Harriman; they are represented, fig. 2 and 2*. Pickeridge has afforded Miss E. Hill the same species.

TEREBRATULA tetraedra.

TAB. LXXXIII.—*Fig.* 4.

Spec. Char. Obtusely deltoid, gibbous, plaited; front elevated in the middle with four or five sharp plaits; four or more sharp plaits on each side; beak rather incurved.

The general form of this shell is a regular tetraedron, the edges of which are rounded, the plaits are very neat and continue to the beak. The distance between the central and lateral plaits is about three-fourths the length of the shell.

This species is plentiful at Aynhoe and in some other places, the shell remaining with a silky lustre and somewhat fibrous texture, like many of its congeners. It is also abundant at Banbury in Oxfordshire.

TEREBRATULA media.

TAB. LXXXIII.—*Fig.* 5.

Spec. Char. Very obtusely deltoid, gibbous, plaited; front rounded, with a rising in the middle composed of six sharp plaits approaching those in the middle; beak a little incurved.

May be distinguished from the last species by its more rounded form, the greater number of its plaits, and the less sudden elevation of the middle.

Also from Aynhoe, and the neighbourhood of Bath.

TEREBRATULA concinna.

TAB. LXXXIII.—*Fig.* 6.

Spec. Char. Nearly globose, acutely plaited, middle elevated by seven plaits; twelve or more plaits on each side; beak projecting.

A very elegant shell, the plaits are very uniform and neat, and continue sharp to the very beak: it is rather wider than long; the length and depth are about equal.

The peculiar neatness of this shell has given it a name. It is from Aynhoe.

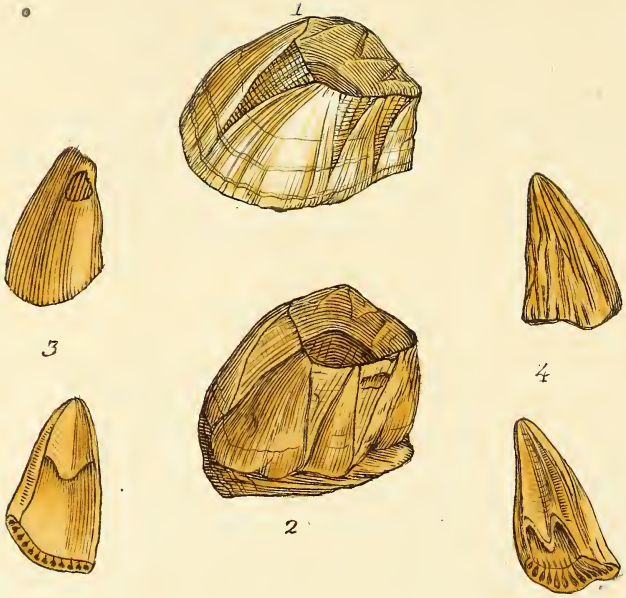
TEREBRATULA obsoleta.

TAB. LXXXIII.—*Fig.* 7.

Spec. Char. Nearly round, gibbous, plaited; middle of the front a little elevated by seven plaits; sides having from seven to eleven plaits: beak projecting.

A flatter and less neat shell than the last, and the middle of the front is less elevated. Depth about two-thirds the length.

This species was sent from Felmersham near Bedford, by the Rev. T. O. Marsh, in 1813, it does not appear to be common. I believe the same species is found in Wiltshire, but the specimens are larger, and the seven ridges are not always so perfectly distinguished from the seven lateral plaits. I have received it also from Gunton near Yarmouth, by favor of Mr. Downs.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BALANUS.

Gen. Char. Conical, composed of four or six valves laterally articulated and fixed by a base. Mouth at the top, having within two or four valves like an operculum.

The operculum is seldom found in extraneous Fossils, because in the recent specimens it is united only by a membrane. Many of the species are gregarious, when the form becomes prismatic instead of conical: the lateral valves are generally composed of tubes.

BALANUS tesselatus.

TAB. LXXXIV.—*Fig.* 1.

Spec. Char. Obliquely conical, thin; valves six, obscurely ribbed, smooth; interstices finely tessellated; aperture oval.

Height rather less than the diameter of the base, the longest diameter of the aperture about half as much.

This species, from Bramerton in Norfolk, has some resemblance to recent species, yet I do not know that it can be referred to any known one. It is thinner for its size than most reliquia.

BALANUS crassus.

TAB. LXXXIV.—*Fig.* 2.

SPEC. CHAR. Oblique, thick; valves six, obscurely ribbed, smooth; aperture triangular.

NOT so conical, thicker, and more irregular than the last; the aperture is four-sided, but three of its angles are more acute than the fourth: its height equals the diameter of the base.

This specimen, from Holywell near Ipswich, by favour of the kind friend to science, Mrs. Cobbold, is the best I have seen. At the same place are found separate valves and fragments, perhaps of the same species. Fig. 4 is rather more ribbed. Fig. 3 is smooth and destitute of ribs; apparently from being worn. The inside projections and pores at the narrowish base are exposed in the lower figures 3 and 4; in one of them which is very thick, the bottom pores are elongated. Perhaps it will become of use to notice these parts as the progress of the yet infant knowledge of organic remains will point out.

Apl 1815.

TRIGONIA.

GEN. CHAR. An equal-valved inequilateral trigonal bivalve, hinge with two diverging elongated compressed teeth, transversely grooved on each side, and fitting into grooved cavities in the opposite valve.

THE trigonal form, although admitted as a Generic Character, is often very obscure. The anterior side of the shells of this Genus is generally separated from the rest by a prominent ridge, and the whole surface is more or less ornamented. In Trigonia margaritacea, of Lamarck, a recent shell which led to the discovery of the nature of the hinge of this Genus, it is said that there are two muscular impressions, but in the fossil species I have not been able to trace more than one: ought they not therefore to be considered as distinct Genera? The difference is of consequence to those who doubt the identity of recent with fossil organization.

TRIGONIA costata.

TAB. LXXXV.

SPEC. CHAR. Triangular, with transverse smooth ribs; anterior side marked with many small and three large prominent longitudinal crenulated ridges.

SYN. Curvirostra non rugosa, &c. *Luid. Lithoph. p.* 36. *T.* 9. *F.* 714.

Trigonia costata. *Park. Org. Rem.* 3. *T.* 12. *F.* 4.

THE posterior angle is very obtuse; the anterior side large, with an obtusely three-angled margin, corresponding to the three larger longitudinal ribs, before the first of which the

transverse ribs that cover the other part of the shell abruptly terminate. Length and breadth nearly equal.

A frequent shell in Great Britain, particularly in the inferior Oölite, as at Little Sudbury Wilts, and at Oxford. I have received specimens from the Rev. H. Steinhauer and Mr. Sheffield. Neither is it rare on the Continent. The specimen figured shows the hinge very distinctly, and also the single muscular impression. It is nearly a solid gray Carbonate of Lime, and being found in an ochraceous matrix, is more or less colored with ochre. Little parasites have formed holes, &c. in most of these shells; sometimes they have vermiculi about them.

TRIGONIA spinosa.

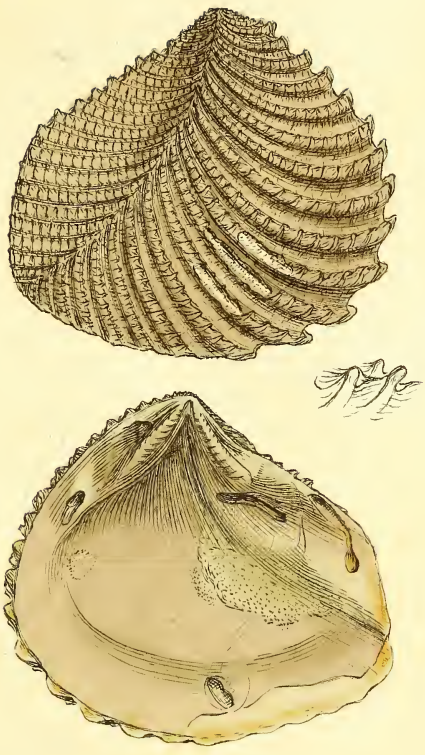
TAB. LXXXVI.

Spec. Char. Roundish, depressed, many-ribbed; anterior side truncated; ribs oblique, diverging both ways from the ridge that separates the anterior side; set with short spines.

Syn. *Park. Org. Rem. 3. T. 12. F. 7.*

The ribs of this shell are composed of tiled plates, the edges of which are twisted up into a sort of flat spines; they are small at their commencement, but increase in thickness as they descend obliquely from the ridge towards the front; they are curved, and terminate very suddenly at the edge. The disposition of these ribs, and the regularity of their asperities, produces a considerable degree of novelty and elegance of feature.

This very curious species is from Blackdown: the casts are siliceous; it conveys, even when magnified, a sort of deception to the sight, and it has its name from that look, which when thoroughly understood, does not appear accurate, and may be the rather unfortunate, as it is likely better to suit some other species hereafter, but the original name must be retained. I am glad to show the hinge, by favor of the Rev. H. Steinhauer. This shell has been penetrated by some curious parasites.



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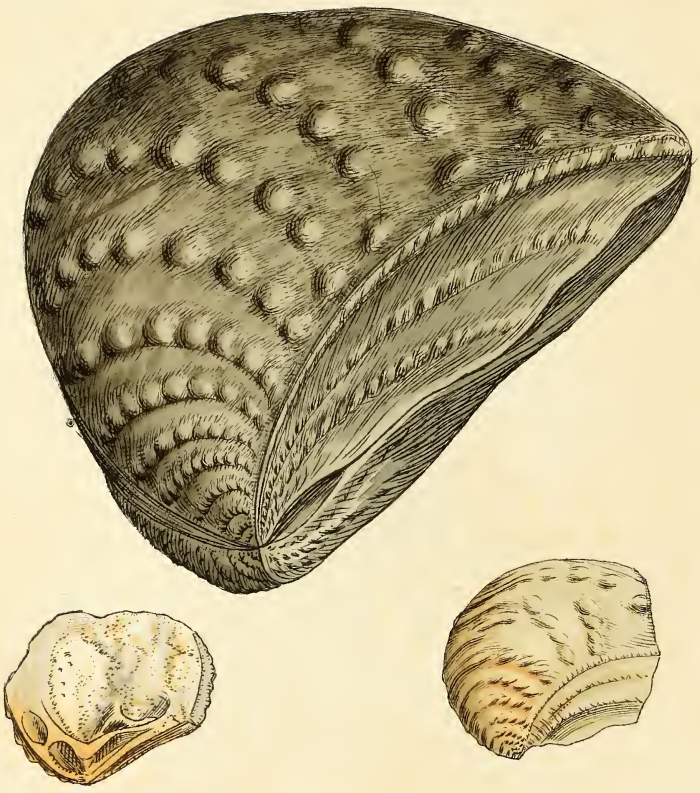

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TRIGONIA clavellata.

TAB. LXXXVII.—*Upper figure.*

SPEC. CHAR. Triangular, rather wider than long, with ten or more oblique rows of tubercles; anterior side straight, with three longitudinal knotted ridges.

SYN. Curvirostra rugosa clavellata major. *Luid. Lithoph. p. 36. T. 9. F. 700.*

Trigonia clavellata. *Park. Org. Rem. 3. T. 12. F. 3.*

THE posterior side and angle are rounded; anterior side straight, slightly gaping near the hinge, and forming an acute angle with the front: there are about ten rounded tubercles perfectly distinct in each row.

I have figured this from a specimen sent me by the Rev. S. Rackett from Radipole near Weymouth; such is also found at Portland. The shell is preserved of much the same texture as a recent oyster shell which has laid in a blackening mud. The same species has been found in Oxfordshire by Mr. W. Walter, and I have a cast in Sandstone, from Gunton in Suffolk, that appears to be the same species, but its length and breadth are more equal, and it is larger. I have also received, by favor of Alexander M'Leay, Esq. numerous specimens of a species much resembling this from Boulogne; they are from one to five inches wide, much wider than long, and can hardly be called triangular, the anterior side is drawn out to a greater length, and the depth is also greater: they are much worn, with oyster-shells sometimes adhering to them: the earth about them is a marly clay.

The lower figures represent a shell which so nearly resembles the larger one, that I can only consider it as a variety: in it a few of the tubercles in each row are united, so as to form interrupted ridges. I thought it a convenient addition to the plate, although the specimen was not very perfect, as it shows the hinge, which the compactness of the stone in the upper specimen prevents the display of. This is from the inferior Oölite at Little Sudbury, by favor of the Rev. H. Steinhauer.

TRIGONIA dædalea.
TAB. LXXXVIII.

Spec. Char. Obtusely rhomboidal, with many oblique rows of tubercles; anterior side angular, with many scattered tubercles, and one longitudinal row, bounded by a longitudinal ridge, on which is another row of large tubercles.

Syn. Trigonia dædalea. *Park.* 3. *T.* 12. *F.* 6. with smaller tubercles.

Nearly half the surface is occupied by the flatter part, which I call the anterior side; from the tuberculated ridge which bounds it, the oblique rows of tubercles which cover the rest of the shell descend towards the front, except near the beak, towards which three or four rows incline; they are gently recurved. The scattered tubercles upon the flatter part are smaller than the others, and are arranged in quincunx order; the length is rather greater than the width. There is a variety with smaller and more numerous tubercles referred to above.

I feel much pleasure in presenting so complete a specimen of this singular and rare species, through the kindness of my friend T. J. L. Baker, Esq. Few specimens have good hinges, but here happen to be the two opposite valves showing the hinge, which Mr. Baker with much pains cleared from the earthy agglutinated particles which adhered to it, so that it is likely to be the most perfect specimen of the species known. It is siliceous or agatized, and semitransparent. I find, by comparing the opposite valves and imperfect specimens, that the series of stud-like protuberances is sometimes more or less interrupted in regularity. On the broader side, however, a peculiar arrangement is very constant; this may be plainly observed on the left hand side of the valve I have pictured. It is that two of the rows a little below the apex diverge from each other, and form an angle, the space within which is filled up by angular sets of tubercles, each like a letter V, placed one within another. The irregular size of the tubercles upon the other half, and their sometimes passing into each other, make the order appear confused. A few single shells have been found orderly and distinct, but there will be no doubt as to the species. It will be seen that the form of the hinge in this Genus is necessarily connected with a thick shell, very unlike the Genus Plagiostoma, with which only (I believe) it has been confounded.

Apl 1815.

Sphaera

CARDITA.

Gen. Char. An inequilateral equalvalved bivalve, with recurved beaks; hinge teeth two, unequal, the shortest beneath the beaks; the lateral one longitudinal, beneath the insertion of the cartilage.

CARDITA striata.

TAB. LXXXIX.—*Fig.* 1.

Spec. Char. Quadrangular, gibbous; the beaks placed at one of the angles; obliquely striated from the beaks to the edge.

Nearly right-angled; the anterior side rounded; the length greater than the width: the striæ are curvilinear.

This is from Swanswick in Somersetshire, by favor of the Rev. H. Steinhauer; it is in ochraceous Limestone with a sandy aspect. It appears to be the cast from the mould of the outside of the shells. Walcot's *(Bath Fossils)* Fig. 11, probably belongs to this species; he observes, "at one of the angles are the beaks which are hooked, their points curved outwards; striated from the beaks to the margin. *Free stone.*"

CARDITA abrupta.

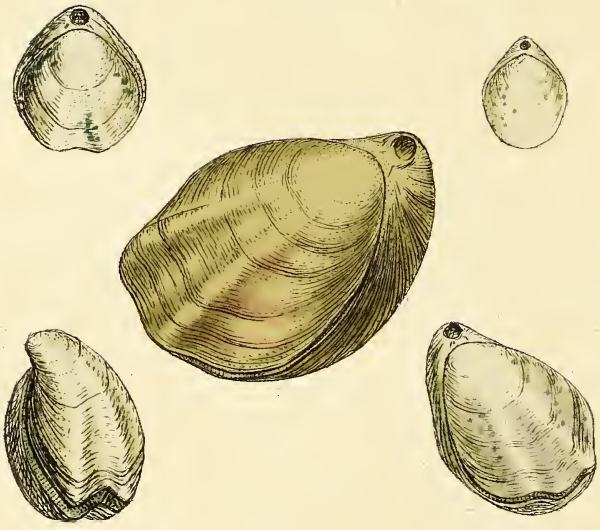
TAB. LXXXIX.—*Fig.* 2.

SPEC. CHAR. Triangular, gibbous; beaks projecting near one angle; obliquely striated, anterior side longitudinally striated; five or six transverse reflected ridges along the front.

SOME of the oblique striæ meet the longitudinal upon the anterior side at an acute angle, the remainder abruptly terminate at the first transverse ridge. The anterior side is nearly straight, forming the shortest side of the triangle: the striæ are curvilinear.

From the same place and by the same favor as the last. The thin shelly remains cover the greater part of the specimen.

Not having seen the hinge of either of these, I cannot pronounce with certainty that I have placed them under the right Genus. I am desirous of seeing more specimens, therefore I make these public, that by thus recommending research, we may learn whether these are mere varieties, and perhaps make further discoveries. There are, probably, many species which may agree with them in Generic character, and which at present want places in the system.



Apl 1815

TEREBRATULA biplicata.

TAB. XC.

Spec. Char. Oblong, gibbous; beak prominent; sides rounded; front straightish, when full grown, elevated with two distant large plaits. Fig. 1.

β. sides rather angular, straightish towards the front, smaller and broader than α. Figs. 2, 3, 4, and 5.

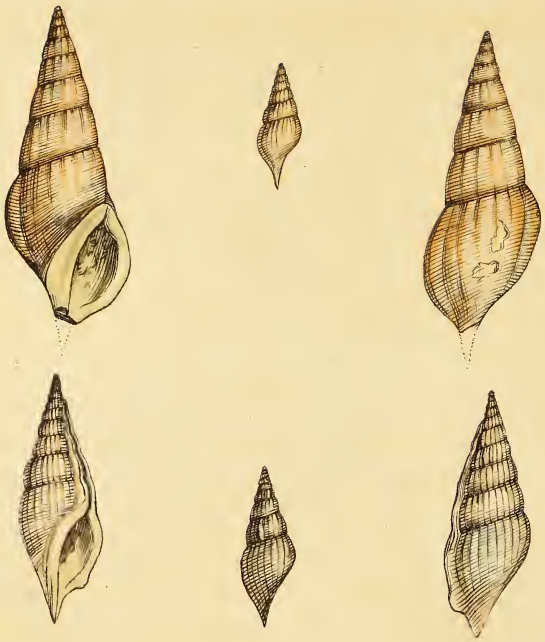
Of the two varieties of this shell, the larger one is longer in proportion to its width, and more gibbous: the younger shells of either seem scarcely to be plaited, and are rather flat.

I was favored with some of the shells, &c. found in digging in the Castle Hill, Cambridge, by Dr. Clarke and H. Warburton, Esq. about ten years since; among the parcel from the latter gentleman was the middle specimen here figured; it was among the marly goult with the green and irony sand, &c. see Brit. Min. tab. 184. Its resemblance to those surrounding it made me place it here, as I think they ought to be identified. It is, however, larger, and the shell not much more altered than recent shells sometimes are. I possess the same variety from Limerick, but more mutilated, the shell not more changed, but having become a shelter for small worms: also another specimen not infected with worms: they appear to be of the same age and size. Hunstanton Cliff in Norfolk affords the

same in a red ferruginous stone, with specimens of which G. B. Greenough, Esq. has kindly supplied me.

Figures 2, 3, 4, and 5, show the growth of the smaller variety, of which the youngest is not at all plaited: as they advance they also become more gibbous. They are found in immense numbers in the green sand of Warminster, and the neighborhood of Longleat, Chute Farm, &c.: they have lost more of the recent shell-like appearance than the above, and are occasionally silicified, the green sand sticking about them.

These seem to join the T. intermedia, which is found in the same neighborhood; see Tab. 15, Fig. 8.



ROSTELLARIA, *De Lamarck.*
Strombus, Linn, &c.

Gen. Char. A fusiform or subturretted univalve, with the base drawn out into a sharp canaliculated beak; the lip expanded by age, either entire or toothed, with a sinus close to the beak, and an elongation upon the spire.

Although there are many recent species of this Genus, we are acquainted with but few fossil ones. It is one of the Genera made by De Lamarck out of the Linnean Genus Strombus, its principal character being the indentation of the lip close to the beak. In some species the upper edge of the lip is extended in a canal nearly the whole length of the spire.

ROSTELLARIA? lucida.
TAB. XCI.—*Figs.* 1, 2, *and* 3.

Spec. Char. Fusiform, longitudinally ribbed, transversely striated; lip thick with an obscure sinus at the inferior edge, and a very short channel at the superior; beak straight, short?

The surface of this species is glossy and covered equally with fine rising obtuse striæ, the ribs numerous and rounded, the whorls about eight, in the young shell the lip is not thickened; when the last whorl is about half-formed its growth is stopped, and the edge of the lip is inflected; it afterwards grows to its full size, and the lip thickens, leaving the inflected part of the former lip in the form of a large rib about half a whorl from the end. The beak is not

perfect in any of the specimens I have seen that appear full grown.

Highgate Hill is the only part of the London Clay stratum that has furnished me with this new shell*, which was found in the attempt to form a Tunnel through it. The shell is usually of a yellowish brown color with a shining fresh appearance, but generally mutilated and rather brittle. The form of the spire so much resembles the young shells of Brander's Murex rimosus, figured in this plate, that without comparison it has often been confounded with it; when compared they are readily distinguished by the obtuseness of the costæ, the gloss of the surface, and the flatness of each whorl in the Highgate shell. The R. rimosa has never been found at Highgate, although many of the other Hampshire shells have, nor does it appear that R. lucida has been found in Hampshire.

ROSTELLARIA rimosa.

TAB. XCI.—*Figs.* 4, 5, *and* 6.

Spec. Char. Fusiform, whorls slightly convex, longitudinally ribbed, transversely striated; lip reflected, with a sinus at the inferior edge below an expansion of the margin, and a canal at the superior edge extending nearly the length of the spire; beak straight.

Syn. Murex rimosus. *Brander Fossil. Hant. F.* 29.

In general the surface is glaucous, the striæ upon it are more distant and stronger near the beak; the ribs are

* Mutilated specimens have been since found, though rarely, in sinking the shaft near White Conduit House, Islington, accompanied by subjects not found at Highgate.

numerous and rather sharp. Whorls about eight. The extension of the lip upon the spire is wanting in very young specimens, but even in them the lip is often thickened; when about half grown the extension reaches across one or two whorls, and when full grown it approaches almost to the apex finishing with a curve. The back is straight with the axis of the spire.

I do not know that this species is found any where but in the Clay at Barton Cliff, where it is abundant. There is a French fossil very nearly resembling this, called Strombus fissurella by Linn. and Rostellaria fissurella by De Lamarck, but in that the ribs are less numerous, the striæ only at the base, and the axis arched, the whole giving a peculiar character immediately perceptible upon comparison. The French shells are found abundantly at Grignon near Paris; they are more delicately preserved, of a whiter color, and are very brittle. The English shell has a more recent appearance, with an horn-like transparency, and darker color. Brander's figure is from a larger specimen than I have been lucky enough to meet with.

Linneus's recent Strombus fissurella should be carefully compared with these fossil species, it may possibly prove distinct. I was favored with some as if gathered before they had been exposed to bleach or change, consequently more like recent ones than usual, by the attention of Miss Pratt.

J. S. June 1815.

AMMONITES jugosus.

TAB. XCII.—*Fig.* 1.

Spec. Char. Involute, depressed, keeled; inner whorls half concealed; radii large, obtuse, straight, equal to the space between them, disappearing on the front; keel small, distinct; aperture ovate, narrowest at the front.

The radii have much the form of undulations, but they are straight and very regular, like some kinds of furrows in a Gardener's ground: the keel which is sharp on the outside of the shell is almost lost in the cast. The septa are not very numerous; their margins are moderately plaited. Volutions four or more. Aperture two-fifths the diameter of the shell, and one-fifth wide. The shell thin and tender.

This pretty specimen is from Mr. Strangewayes, a warm enquirer after the information the study of Fossils affords; it was broken out of Limestone at White Lackington Park near Ilminster, and shows the distant septæ, as well as the crystals of Carbonate of Lime lining the chambers; the shell itself is attached to the stone, it is very thin.

AMMONITES triplicatus.

TAB. XCII.—*Fig.* 2.

Spec. Char. Involute, inner whorls exposed; radii twice curved, alternately one long and three short; a smooth line along the front; aperture obovate.

I could only describe a cast of this, the shorter radii extend rather more than half-way from the front towards the centre, there are commonly three, but sometimes only two between a pair of long ones; the long ones are rarely forked. Volutions about four. Aperture about half the diameter long, and one-third wide; septa rather distant.

This came from Portland Island, it is a cast in pyrites with Carbonate of Lime in the chambers. I was favored with it by the late Mr. Bryer of Weymouth.

AMMONITES binus.

TAB. XCII.—*Fig.* 3.

Spec. Char. Involute, depressed, keeled; inner turns two-thirds exposed; radii diverging in pairs from round tubercles, swelling and then turned up towards the front and disappearing; keel small, entire; aperture oblong rectangular, angles rounded.

Volutions about four; aperture one-third the diameter long, and rather more than one-sixth wide; there are some-

times single radii between the pairs; the tubercles are placed near the inner part of each whorl.

A pyritaceous cast from Bramerton in Norfolk.

AMMONITES ellipticus.

TAB. XCII.—*Fig.* 4.

SPEC. CHAR. Involute, depressed, carinated; inner volutions two-thirds exposed; radii broad, slightly curved, few, obscure near the margin; aperture acutely elliptical; keel sharp.

THE regular elliptical form of the aperture is a strong character of this shell; the obtuse radii are distant and correspond with the septa in number.

My esteemed Friend, James Brodie, Esq. brought me this pyritaceous cast of an Ammonite, with other curiosities, from Charmouth: It was found among the marley clay of that place, so celebrated for various and numerous productions; I myself saw an imperfect impression of an Ammonite there, some years since, which was above a yard in diameter in a stone on the shore, but I do not remember the species. The remains of Crocodiles (as they have been commonly thought) consisting of teeth, jaws, vertebra, &c. show the place to have been an extraordinary deposit continually discovered by becoming again a prey to the sea, which seems once to have formed it, although no such things are now found in a recent state.

AMMONITES nodosus.

TAB. XCII.—*Fig.* 5.

SPEC. CHAR. Involute, depressed, keeled; volutions but little concealed; radii straight for two-thirds of their length, then rising into a small knob, from which they extend towards the keel, curving upwards, rather distant, with a gentle concave between them; keel broad, obscure.

THE aperture is oblong, broadest towards the front, which is rounded; it is one-third the diameter long, and rather more than one-sixth wide: the keel, which is plain externally, is crenulated internally or on the cast.

From Scarborough, by favor of Mr. Strangewayes; it is in a dark brown clay. I think it undoubtedly belongs to the keeled division of Ammonites, as it agrees with them in general character, although the front is broad, and the keel obtuse.

J. S. June 1815.

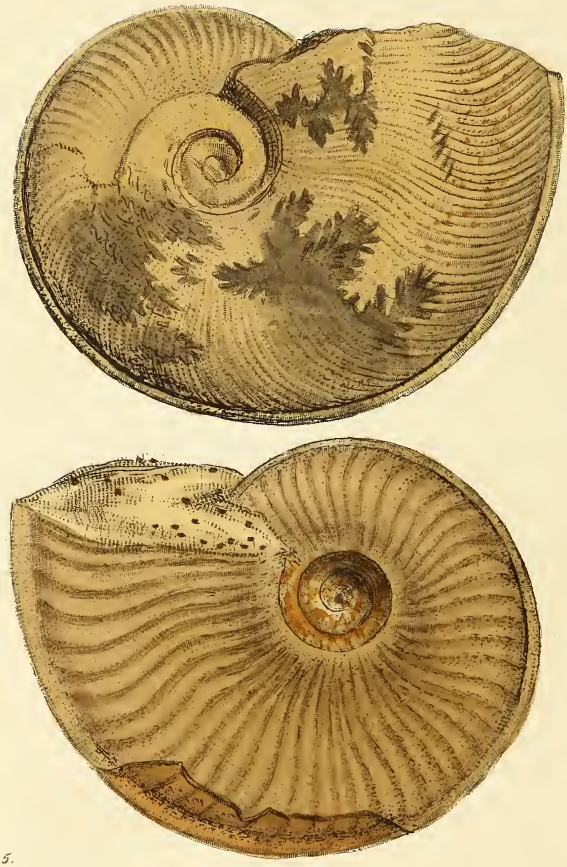
AMMONITES stellaris.

TAB. XCIII.

SPEC. CHAR. Involute, rather depressed with a rounded sulcus on each side of an obtuse keel; inner turns about two-thirds exposed; volutions about four with their sides flattish; radii numerous, straight; aperture quadrangular, with the interior angles rounded.

THE sinuous margin of each septum is crossed by two radii, the septa are placed at each fourth radius. The siphuncle is contained in the keel, as in most of the carinated species. The aperture is rather longer than wide; its length is two-fifths the diameter of the shell. Surface of the shell marked with obscure rather distant decussating striæ.

Found rather abundantly at Lyme in Dorsetshire; Mr. Strangewayes has forwarded it to me. I broke one specimen to find the siphuncle, and thus separated three or four joints by the septa, so as to hold together like a chain, being moveable like the dissepiments of some other species, without falling apart, the sutures fitting in a sort of dovetail manner. This specimen is remarkable for the more central volutions having a pentagonal figure. When the shell covers the cast the sutures of course are covered, and in some species the external form is different from the internal, but a part of the shell which remains towards the front at the bottom shows that in this they do not probably differ.



J S June 1815.

AMMONITES elegans.

TAB. XCIV.—*Upper Figure.*

Spec. Char. Involute, much depressed, acutely keeled; volutions about three, inner ones about two-thirds concealed; radii twice curved, numerous, equal; keel distinct, entire; aperture acutely triangular; internal angles truncate.

A delicate species with a thin shell; thickness about one-sixth of the largest diameter; it gradually lessens towards the edge, which is rather obtuse with a sharp keel placed upon it. The septa are tolerably close with their sinuous margins much plaited; the siphuncle slender within the keel.

This species was gathered between Ilminster and Yeovil by Mr. Strangewayes, who possesses this beautiful specimen; I have a fragment of a larger one which was given me as British. The plaited margins of the septa are sometimes beautifully conspicuous; a few of the chambers being occasionally filled, as it is partially here, by spar of a darker tint; at other times it is more regular all over, pointing out the septa conspicuously, where otherwise they would not be discernible, as is particularly the case with some other species.

AMMONITES concavus.

TAB. XCIV.—*Lower figure.*

SPEC. CHAR. Involute depressed, keeled, umbilicate; umbilicus a large hemispherical depression; volutions four, concave near the centre; radii numerous, curved, unequal in length, obsolete near the centre; keel sharp, entire; aperture acutely triangular; external angle rounded; internal angles obliquely truncate.

APERTURE half the diameter of the shell, with the sides rounded, approaching to parallel; the radii, which are very conspicuous over half the whorl, are alternately long and short, the longer ones often continue, but obscurely, to the centre, the others sometimes join into them. The thickness is one-sixth of the diameter. The shell not very thin.

This general form and undulating character of the costa is not very rare, but the peculiarity of a regularly concave centre is a convenient distinction at present. This is not a rare species in the neighborhood of Ilminster, and I have had some larger ones long since by favor of the Rev. Dr. Sutton of Norwich. Specimens generally consist of nearly transparent Carbonate of Lime, more or less covered with an ochraceous marle; the one I have figured is filled with granular Limestone.

AMMONITES armatus.

TAB. XCV.

Spec. Char. Involute, volutions exposed, with many annular undulations armed with two rows of large short furrowed spines.

Volutions six or seven, pressed against each other, the undulations continue upon the spines, and after meeting on the point pass on to the other side: there are about five undulations upon each spine, and one between each. The aperture is obscurely four-sided, the inner side being smallest and concave. When the shell is broken off the cast the spines are succeeded by an ovate flat disk, over which the margins of the septa are beautifully delineated. The siphuncle is visible, as in most of the Genus, near the front. The young shell is plain and without the spines.

Numerous varieties of this species are found in the great Alum-clay formation at Whitby, where this large-sized specimen was gathered by Mr. Strangewayes, by whose favor I have thus been enabled to draw a larger specimen than I possessed. We have here also the advantage of many specimens, the middle being a small plain one of which many are occasionally found, which indeed might have been considered a different species; the next circle might by the same rule form a second species with larger radii, and again the third with the flat disks and fewer striæ than the outer circles. I have separate specimens of most of these different sizes; they are liable to be destitute of the inner volutions. It is worthy of

remark that the spines have the appearance of having been stuck on, probably owing to their being attached to part of the outer shell which is worn away at their bases, the spines sometimes being gone also. These shells or casts being chiefly pyrites decompose easily, exuding the flowers of Sulphur if in a dry place, or Sulphate of Iron if wet, when they have the sulphurous odour and occasionally fall to pieces, which may be the case with this large shell, the odour and sulphur exuding from its sides being signs of it. In such when the subjects are sufficiently desirable they may be kept under water in stopped bottles. The little outline at the bottom shows the contour of one of the septa and the siphuncle.

J.S June 1715

TEREBRATULA digona.

TAB. XCVI.

Spec. Char. Triangular, oblong, gibbous; beak prominent; sides rounded; front either convex or concave; when old, bounded by two prominent angles alike in each valve.

This shell is very variable in its form, being sometimes almost globose, at others acutely triangular and rather depressed, the two angles of the front are continued a little way along each valve, and look as if they were produced by pinching the edges between the fingers; the front between the angles is in some shells concave, in others straight or of different degrees of convexity. The surface when magnified is found to be minutely punctured.

This is very common in the neighborhood of Bath; it is mentioned by Woodward, Walcot, &c. but we cannot be certain of synonyms at present, as there are so many varieties, and it may hereafter be found that in some soils they are more constantly of one particular form and color than of another. Walcot's fig. 26 seems related to it, and he quotes Woodward, vol. 1, part 2, page 46, fig. 215, 216, and says specimens are "scarce; Woodward found them at Toghill, and he met with one or two nearer Bath." I have expressed, figs. 1, 2, and 3, three varieties from among a parcel found in Clay above the great Oolite at Bradford and Pickwick,

by favor of the Rev. H. Steinhauer; they resemble some sent me by Thomas Meade, Esq. from the Cornbrash stratum near Chatley, of which they are said to be characteristic; they are mostly rounder, but with the same kind of points. The Rev. T. O. Marsh has sent me specimens from Felmersham, one of which I have given two views at fig. 4 and 5. These are more gibbous than those from Bradford, but less so than the Chatley ones, some of which are almost globose.

INFUNDIBULUM, *De Montfort*, 2. 166.

Part of the Genus Calyptræa, *Delamarck, Syst. des animaux sans vértebres*, 1. 70. *Environs de Paris*, 16.

Gen. Char. Univalve, obconical, hollow beneath, spirally twisted; with a central spiral columella and a spirally decurrent plate or valve within: mouth round, expanded; lip entire, sharp.

The edge of the internal plate generally diverges obliquely from the centre towards the edge, near which it bends so as to enter it at a very sharp angle; the lines of growth are nearly circular, but placed obliquely.

If we consider this shell, with De Montfort, as regularly spiral, it will be found to consist of a triangular involute tube, the inner side of which is wanted to make it complete, the outer lip of the aperture forming the whole of the concave base; the inner lip extending only to the centre in one direction, and not always to the margin in the other. It appears most natural to view it as Delamarck and others have done, in its relation to Patella and Crepidula, in conformity with which I have formed the Generic Character. Although, in many instances, De Montfort has multiplied Genera beyond their natural limits, in separating this from Delamarck's Calyptræa, he has done an acceptable service to the student in Conchology, but he has surely gone too far on the same road with older authors in removing it to a place so near the Trochus.

INFUNDIBULUM rectum.

TAB. XCVII.—*Fig.* 3.

SPEC. CHAR. Conical, concentrically striated; apex central, acute, turns of the spire obsolete; valve rectangular; columella slender.

THE valve within this takes scarcely more than one turn; in the place at which it approaches the edge that forms the columella, it is expanded so as to have an angular form, and it has no part reflected, as in other species, like an umbilicus. The striæ of growth are very conspicuous.

This has more the external character of Patella than most of the species of this Genus. It is from Holywells, near Ipswich, by favour of the scientific Mrs. Cobbold.

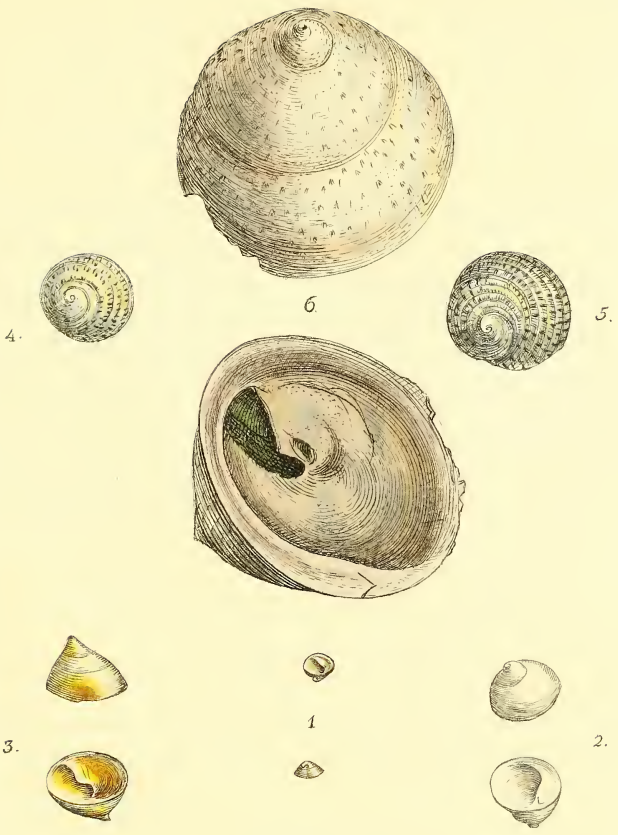
INFUNDIBULUM obliquum.

TAB. XCVII.—*Fig.* 1.

SPEC. CHAR. Flattish, smooth; apex curved, adpressed, oblique; internal plate two thirds the diameter of the mouth.

THE edge of the internal valve is reflected near the columella, so as to resemble in some measure an umbilicus, as is the case also in several other species; the upper surface is regularly conical and very smooth, but the apex is bent towards one side.

A perfect but small specimen from Brakenhurst, in Sussex, is represented; the species is found much larger in the Cliff, at Barton, from which place the Rev. W. Bingley has kindly sent me specimens.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INFUNDIBULUM tuberculatum.

TAB. XCVII.—*Figs.* 4, *and* 5.

Spec. Char. Gibbous, conical, oblique, rugosely tuberculate.

Syn. Trochus apertus. *Brand. Foss. Hanton. Tab.* 1. *figs.* 1 *and* 2.

Turns of the spire three or four; the latter one inflated, covered by rows of rugged projections.

Brander's name, apertus, is applicable to all the species of Infundibulum, and is therefore objectionable, but while the shell was considered a Trochus, is exhibited a remarkable character. Brander has been wrongly quoted by Delamarck, who makes Brander's T. apertus and operculatis the same as his Calyptræa trochiformis and my Infundibulum spinulosum.

INFUNDIBULUM echinulatum.

TAB. XCVII.—*Fig.* 2.

Spec. Char. Gibbous, depressed, conical, oblique; apex acute, smooth, last turn obscurely echinulated.

Spiral turns three or four, the last being much the largest, the others are well defined, and often rather ventricose. The short spines are most prominent near the edge, but even there they are in many specimens worn away, as in the one figured. The internal plate resembles that of the last in form. Diameter sometimes three-fourths of an inch.

Found with Cardium plumstediense, and numerous others, in a bed of shells, mostly in fragments, which lies between two beds of rounded pebbles, at Plumsted. In the upper bed the pebbles are much larger than in the lower, and stratified with a little Clay and Carbonate of Lime.

INFUNDIBULUM spinulosum.

TAB. XCVII.—*Fig.* 6.

Spec. Char. Conical, apex acute, nearly central; whorls obscure, surface covered with numerous short hollow spines or small tubercles.

Syn. Calyptræa trochiformis α? *Delamarck, Foss. des env. de Paris,* 17. *excl. Syn. Brand.*

Whorls three or four, those about the apex a little inflated, but obscure. The spines are extremely short, and rather reflected. Nearly an inch and half in diameter. The indistinctness of the turns, and their want of gibbosity at once distinguish this from I. echinulatum. The want of specimens from France makes me uncertain respecting Delamarck's synonym, as his description will suit either, although it will not include the two rugose species of Brander's work.

The size and rarity of this specimen render it a desirable addition to our catalogue. Although a fine specimen, we have reason to wish it were less crushed, which must plead for our imperfect figure. It was found at Barton, and is in possession of the indefatigable collector, Miss Benett, whose desire to assist science and give information, will ever be respected.

TROCHUS, *Linn. &c.*

GEN. CHAR. Univalve, spiral, conical; base flat or concave; aperture transversely depressed, subquadrangular; axis oblique.

WHORLS more or less carinated, the keel of the last forming the margin of the base. Some species are umbilicate when young, the umbilicus being covered in old shells; in other species the umbilicus is permanent, and some have a solid columella. The Phorus of Montfort may, perhaps, hereafter prove a good Genus, but the variable umbilicus and the agglutinating practice of the animal are too uncertain for generic distinctions. The other characters are found to be gradually shaded off when we examine many species.

TROCHUS agglutinans?

TAB. XCVIII.—*Smaller figures.*

SPEC. CHAR. Depressed, conical, smooth; base expanded, with a broad waved margin; whorls externally deformed; umbilicus plicate; aperture oblong.

SYN. Trochus agglutinans? *Delamarck, Foss. des environs de Paris,* p. 102.
T. umbilicaris. *Brander, Foss. Hant. figs.* 4 & 5.
Phorus agglutinans. *De Montfort,* 2. 158.

MUCH irregularity in the upper surface and margin of this is produced by the shells and fragments of other substances that become attached to it, which has procured it from some the appellation of "the Conchologist," from others, that of "the Builder," "the Carrier," &c. The smooth, uninterrupted part of the surface is only marked by striæ of

growth, which are particularly strong over the base, running into the large umbilicus in plaits. External lip obtuse, internal sharp, about half extended over the base of the spire. The undulated margin seems the part mostly designed for collecting shells, &c.

This is one of those few fossils which agree so well with analogous recent shells, that they can with difficulty be distinguished as varieties. The American shell commonly styled "the Carrier," is so nearly allied, that Delamarck says he could not distinguish it. Our specimens are from Barton.

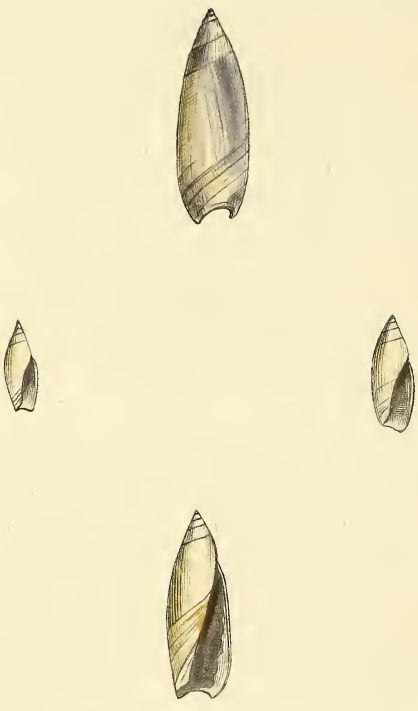
TROCHUS Benettiæ.

TAB. XCVIII.—*Larger figures.*

SPEC. CHAR. Depressed, conical; upper surface obliquely wrinkled; base expanded with a broad waved margin; whorls externally irregular; umbilicus plicate, partly covered; aperture narrow.

THE obliquely striated or wrinkled surface, which bears some resemblance to the rippling of shallow water, marks this as decidedly distinct from the last; in other respects, what has been said of that will apply correctly to this. The umbilicus being partly covered by the lip is the effect of age. The spire is less irregular than usual.

This elegant specimen is in possession of Miss Benett, who has been so fortunate in meeting with many rarities. It would have been a great satisfaction to have met with it without the aperture being crushed in, which makes it more difficult to comprehend. This is, however, sufficiently distinct to be recognized as a species, and perhaps we may never see such another: I have therefore named it in honour of its possessor.



ANCILLA, *Delamarck.*

Voluta, Linn.

Gen. Char. Univalve, spiral, oblong, subcylindrical; spire short, without a canal; aperture longitudinal, expanded, slightly emarginate at the base; a tumid appendage, or varix, round the base of the columella.

The last whorl is much larger than the others, whence the aperture is often equal in length to half the shell. The varix is frequently plaited, and the inner lip is, in several species, continued farther over the spire than the outer; in some it even reaches over the line of separation of the whorl before it.

After the Genus Oliva had been defined to have a canal between the whorl on the spire, it became necessary to separate such analogous shells as were destitute of that mark, into another Genus, but I fear there are intermediate ones, which will render that character ambiguous, such as my Ancilla turritella, which, although it has no canal, has a concave space approaching one.

ANCILLA aveniformis.

TAB. XCIX.—*Middle figures.*

Spec. Char. Oval, elongated, smooth; spire long, acute, varix with two plaits; extension of the inner lip short. Aperture little more than half the length of the shell; inner lip extended over about one-third of the exposed part of each whorl; surface shining.

One of the few shells from Barton not figured by Brander; it differs from Delamarck's A. buccinoides, in having a

longer spire, a less expanded base, and smaller extension of the inner lip. It may be Voluta anglica of Pilkington in Linn. Trans. 7. 116, t. 11, f. 1, but that is described as "*obliquè striata.*"

ANCILLA turritella.

TAB. XCIX.—*Larger figures.*

SPEC. CHAR. Subcylindrical, with an acute subturreted spire, minutely and transversely striated; upper part of each whorl shining, middle minutely decussated; an obscure spiral sulcus near the varix; columella with three plaits, and one deep sulcus.

LAST whorl nearly cylindrical, with a large sinus at the base; the aperture is above two-thirds the length of the shell, expanded, and having a small tooth at the edge; the sulcus in the varix of the collumella is nearly longitudinal, commencing near the base. The interior lip extends over two-thirds of each of the volutions.

Two fine specimens of this species, found in the Cliff at Barton, which had escaped the keen eye of Brander, have come into Miss Benett's collection.

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TEREBRATULA ovoides.

TAB. C.—*Upper figure.*

SPEC. CHAR. Ovate, elongated; beak prominent; larger valve gibbous subcarinated; lesser valve convex.

THE sides have an obtuse angle or shoulder at about one-third the length from the beak; more or less prominent in different specimens. Length almost twice the width; the front rounded, undefined.

Found in blocks of Sandstone containing green Sand, in alluvial deposits of Gravel, fragments of Chalk, &c. in some parts of Suffolk, by my friend, Charles Wilkinson, Esq.

TEREBRATULA lata.

TAB. C.—*Lower figure.*

SPEC. CHAR. Orbicular, depressed; beak prominent; larger valve subcarinated at the back.

THE length and breadth of the smaller valve are equal. There is no perceptible difference between this and ovoides, excepting in the length.

Found in blocks of Sandstone in the same situation as the last, at Gisleham, near Lowestoft, in Suffolk, by Mr. John Thurtell: the stone often contains grains of an argillaceous Iron ore.

TEREBRATULA ornithocephala.

TAB. CI.—*Figs.* 1, 2, *and* 4.

SPEC. CHAR. Ovato-rhomboidal; depressed when young; elongated and gibbous when old; front straight, bounded by two obtuse lateral depressions, similar in each valve.

THE aperture in the elongated beak is large. Breadth of the shell equal to four-fifths of its length: the sides being rather

depressed, produce an obtuse angular projection on the front.

I have specimens of this from the Cornbrash Limestone, at Chatley, from Thomas Meade, Esq. and others picked out of the Blue Lias (Marle), at Pickeridge, by favour of Miss Hill. The left-hand upper figure is from a Cornbrash Limestone specimen, and figure 4 is a young depressed shell, from Pickeridge.

TEREBRATULA lampas.

TAB. CI.—*Fig.* 3.

SPEC. CHAR. Ovato-rhomboidal gibbous; front straight, produced, lesser valve depressed.

CLOSELY resembling the last, but the sides are not concave, the sides of the larger valve being only slightly so; the flatness of the other valve gives the whole much of the contour of an antique earthen lamp.

My figure is from a cast in ferruginous Sandstone, from near Lyme, Dorsetshire, where I believe they are common in this state.

TEREBRATULA obovata.

TAB. CI.—*Fig.* 5.

SPEC. CHAR. Obovate, transverse, gibbous, flattish; beak prominent; front straightish, bounded by two obsolete plaits.

A VERY short shell, with rounded sides and a flattish margin; the length, excluding the beaks, is rather less than the width; the plaits which bound the front are sharp, but small, and only marginal.

A specimen from Mr. Meade's garden, at Chatley. It differs from the Chatley variety of Terebratula digona, tab. 96. in being much shorter, and in the points or plaits at the front being very obscure.

TEREDO, *Linn. &c.*

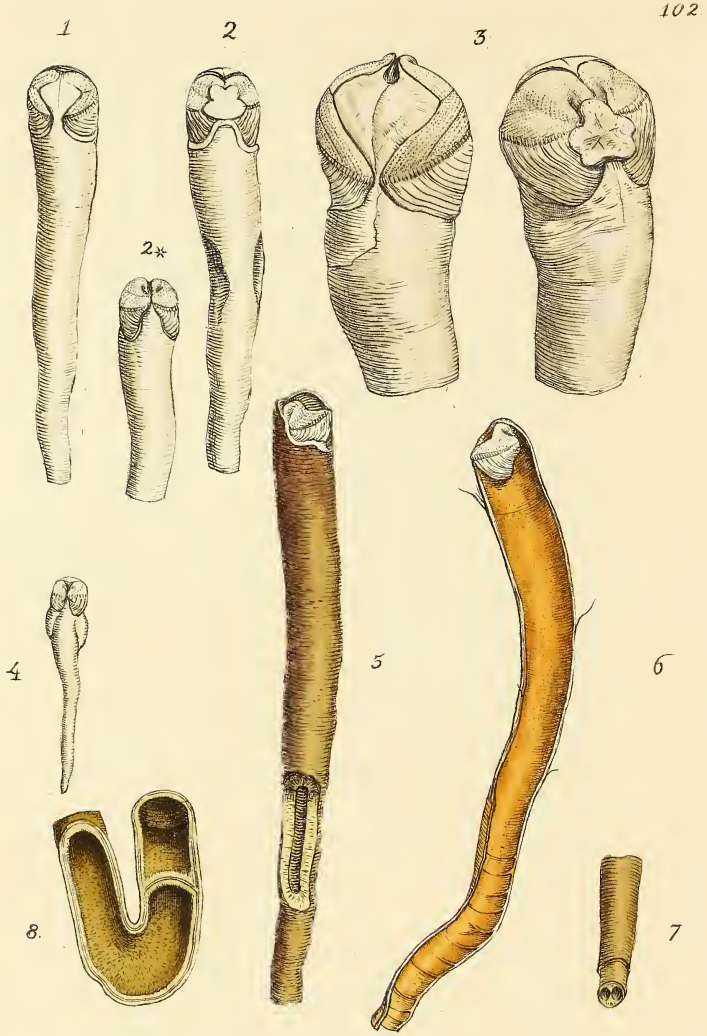
Gen. Char. Bivalve, gaping; back and posterior side closed by membrane or shelly valves terminating an accessory shelly tube. Hinge with one tooth in the right valve. A long free process arising from the beaks contained in each valve.

The principal valves are longer than broad, striated, gaping at both sides and at the back; in the posterior side of each is a deep rectangular sinus; in the anterior side is a corresponding small rounded sinus; the front is lanceolate, with an internal tubercle at the extremity; one of the accessory valves lies over the beaks and is lobed; another is trapezoidal, covering the sinus at the posterior side, it has a line down the middle where there may possibly be an opening, or it may indicate two valves. The membrane which covers the shell is extended over the anterior side, forming a taper tube many times longer than the proper shell, and strongly impregnated at a little distance from the valves with shelly matter; in the extremity of this lie two spatulate valves, attached by muscles to the animal, and capable of closing the aperture, in which is placed a longitudinal septum; this tube is slightly attached to a tortuous passage bored in wood by the animal, and is elongated and gradually increased in diameter as the animal recedes further into the wood.

The resemblance between this Genus and several species of Pholas is remarkably strong; the species of Pholas nearest related to it are those which have one lobed accessory valve covering the beaks; these have also a tooth in the hinge close to the beak, so that there remains nothing except the greater proportional breadth (which makes the

Pholas a transverse shell) and the want of the shelly tube, to distinguish them. The form of the animal is very different, that of the Teredo extending far beyond its proper shell, and having at its extremity two spatulate valves; whereas the animal of the Pholas is confined to its shell, and has not these additional valves. They both bore into wood, and apparently by a similar process; that is, by repeated semi-circular turns backwards and forwards while the valves are partly opened, cutting the wood with the striated or rough posterior part of their margins, which as they wear blunt, are succeeded by fresh additions at their edges; the cutting part may be compared to a series of files, bent so as exactly to fit the size of the holes they are required to make; now, as the animal grows older, he requires a larger hole to live in, and the files being renewed along the edge of the shell, are increased exactly in the same proportion as he grows, and the degree of their asperity is proportioned to the substance they are to bore, so that each one may cut a sufficient space for itself to turn round in before it is worn away: consequently, in the Teredo, which only bores wood, the striæ on the posterior part of the shell are very fine, and cut into minute teeth; while in those species of Pholas which bore into stone, there are rows of prominent angular reflected teeth, presenting strong sharp points to the surface they are to act upon. The motion of the Teredo is probably confined to a smaller part of a circle than that of the Pholas, in consequence of the shelly part of its tube being fixed.

These observations are made upon examining the only two species of the Genus Teredo with which I am acquainted, T. navalis, *Linn.* and the fossil one. Among the specimens of the first that have fallen under my inspection, I have met with none which show any of the accessory valves, except the tube and the two spatulate valves attached to the animal, nor even the membrane that is preserved in


1
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8.

the fossil one covering the proper shells, and attaching them to the outside of the tube. I hope persons resident near the sea will make search to ascertain whether they exist, and whether the posterior side is guarded only by a membrane. Hitherto naturalists appear to be as much in the dark respecting these animals as the animals themselves are in their obscure retreats; and it is only the fortunate circumstance of a specimen of petrified wood, in which many of them had been trapped, decaying away from them and leaving their outer surfaces perfect, that has permitted me to see so much of their nature.

TEREDO antenautæ.

TAB. CII.

Spec. Char. Valves transversely striated; striæ on the anterior side numerous, smooth; dorsal and posterior accessory valves shelly.

Syn. Fistulana personata, *Delamarck, Foss. des env. de Paris,* 160. *Park. Org. Rem. 3 p.* 200. *t.* 14. *f.* 8. 10.

The striæ follow the zigzag edge of the shell, those over the posterior side are very fine and regular, and under a lens appear minutely toothed; on the other side they are stronger but less regular and smooth. The dorsal accessory valve, called by Delamarck and Parkinson, *the rotula*, is thick, four-lobed, with rounded edges, the two posterior lobes are the smallest. The valve that closes the posterior sinus is marked with lines of growth parallel to the edges of the shell and is very thin; the tube near the valves retains, in the large specimens, a wrinkled form, and some of the smaller ones are inflated in parts, showing their original membranous texture. *See figs.* 4 *and* 5. At a dis-

tance from the valves the tube is of a firm, shelly texture, smooth and shining. The animal seems to have been capable of separating itself from this tube, which is not attached to any sensible part of it, and of returning towards the place where it first entered; in this case it forms a septum behind it across the tube, contracting its dwelling to a size experience has taught it is sufficient.

The Teredo navalis may be distinguished by the following—

Spec. Char. Valves transversely striated on the posterior side; anterior side smooth, with only a few lines of growth.

The dreadful ravages committed upon timber by this destructive borer, seems to have commenced as soon as timber was immersed in sea-water, and long before ships were invented; whence I have named the Fossil species, *antenautæ*, and would retain Linné's name for the common recent one that has been so formidable ever since the Europeans visited India. Whether it penetrates the wood for food or only for shelter, is doubtful; if it work for shelter only, why does it penetrate to such a distance from the surface? and if it feeds upon the wood, would not its mouth first enter, instead of its boring with its posterior part? The position of its mouth and the analogy of other testaceous animals, rather show that it feeds upon such small molusca as may chance to enter the narrow porch of its winding habitation, and be surprized by a gigantic enemy lurking in secret.*

Delamarck must have had a very imperfect specimen, or he would not have hesitated to have placed this as a Teredo (for he has observed its resemblance to that Genus and to Pholas), instead of confounding it with several other boring shells, which (independent of a calcareous covering attached to their external surfaces, and which, in a few

* The Pholas, &c. appear often to recede to a distance from the external parts of their holes.

instances, they seem to form for themselves), have all the characters of Modiola: even with respect to these, he is sometimes mistaken, for in several of the Fossil species he has described, what he calls the tube is no more than a solid mass of marley Stone, filling the hole in which the shell lies, enveloping it and preserving its form, while the Coral or substance the shell has bored into, has decayed away. I have specimens in several stages of decay, both foreign and English, with the impressions of the Coral upon their surfaces. Parkinson has figured similar ones, *Vol.* II. *t.* 12. *f.* 1 and 2, and in *Vol.* III. *t.* 14. *f.* 6 and 12, and I have figured others in British Mineralogy, tab. 323, under the name Mytilus tunicatus. Delamarck seems to have had a right conception of the recent ones, such as Modiola curvirostra, *Brit. Min. Vol. 3. p.* 182, Mytilus lithophagus var. *Linn. Trans.* VIII. *p.* 270, *t.* 6, *f.* 2, and would perhaps have left them with the Modiola, had he not been misled by the Fossils.

Figs. 1, 2, and 4, are from specimens selected from a large decaying mass of fossil wood, the hollows of which were filled with Marle; masses of wood thus preserved were found in great abundance in the Highgate Clay, towards the part on the southern side of the hill, where the Sand commenced, and on exposure the wood became powdery, while the shells became more or less chalky, and were easily separated. Some few specimens in the medium state were obtained: the wood formed a sort of cylinder, and the animal's broader ends were all around its centre, pushing, as it were, for the greatest share, the largest forwardest, and so on in succession, to those not so big as a barley-corn filling the interstices, the intervening ones often having two or three protuberances, like rollers or cushions of defence, (fig. 4) to keep them from the larger ones, and sometimes the larger ones seemed to have impressions in their sides corresponding with them, as if obliged to give way; the

tube commences from a very small point outwards at the bottom or sides of the wood; the embryos were deposited in abundance externally very near each other, they all started to pursue their way into the wood in courses more or less parallel, and when any one got before another, it seemed to have roamed across the grain, its competitor being interrupted and apparently stinted by that manœuvre. They sometimes curve and even double and have partitions (see fig. 8), but are more frequently without any partitions. I have not detected the spatulate valves. The connection of the valves with the tube is curious; the dorsal valve is more independent and is rather rare, as it is easily detached, and then the beaks of the hinge seem perfect, so that it might not be expected by those who had not by chance seen it. Fig. 3 is taken from a specimen of an uncommon size, the dorsal valve is broken in a way to make it irregularly five-lobed, which is too strongly expressed in the figure. I have tubes that appear to correspond with it from Highgate, they may, perhaps, have been two feet long. I have also some parts of tubes from Southend, in Essex, and Sheppey, in Kent, full as large in diameter. Figs. 5 and 6 show tubes as they appear in the more solid masses of Marle when broken. Fig. 6 presents a series of undulations not unfrequent and often more extensive. Fig. 7 exhibits the septum or the lodgments of the two spatulate valves at the aperture of the tube, a part very rarely found fossil. Fig. 8 has a transverse septum in the wide part of the tube. See *Park. Org. Rem. Vol.* III. *p.* 205.

The whole extent of the London Clay stratum and the other Clay strata above the Chalk, furnish masses of rotten wood perforated by Teredines and impregnated with argillaceous Marle, and Pyrites. The tubes of the Teredines are mostly lined with brown and resin-like Carbonate of Iron in spicula, &c.

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CORRIGENDA.

Page 42, line 22, for "they" read *the shells.*
42, l. 1, for "plumstedianum" read *plumstediense.*
43, l. 7, ditto.
58, l. 1, for "planus" read *plana.*
69, l. 2, for "fig. 1" read *fig.* 2.
176, l. 3, for "δομα" read σομα.
177, l. 12, for "these" read *there.*
187, l. 2, for "Figs. 1 and 2" read *Figs.* 1 *and* 3.
188, l. 18, for "Fig. 3" read *Fig.* 2.
191, l. 6 from the bottom, after "plaits" read *lateral plaits.*

A SUPPLEMENTARY INDEX TO VOL. I.

Arranging the Shells *described therein according to the several* Strata *in which they are found imbedded, from the newest towards the oldest in the British Series.*

THE completion of my first volume of MINERAL CONCHOLOGY, the publication of Mr. *William Smith's* very long expected *Map of the Strata* of England, Wales, &c. and its accompanying Memoir, and the publication of Mr. *Aaron Arrowsmith's* very large and minutely detailed *Map* of England and Wales, having all happened about the same time, have given the means and increased the facility of arranging the 212 species of Shells contained in the preceding Index, according to their respective places in the Series of strata; that is, according to the eras in which these shell-fish respectively lived, beginning with the most recent.

For this Supplementary Index I am indebted to my indefatigable friend, Mr. *John Farey* sen. author of the Mineral Report on Derbyshire, and many geological papers in the *Philosophical Magazine*, &c., who desires it may not be received as a perfectly correct arrangement, for which the *localities* mentioned were not always sufficiently minute and particular, nor is the order of the strata in every instance settled beyond controversy, but is submitted for the revisal and free correction of my readers and correspondents, either in their letters to me, or to Mr. Tilloch, the Editor of the *Philosophical Magazine;* in which useful work Mr. F. proposes to publish an Alphabetical List of all the *places* herein mentioned, with their *situations* and *strata*, and a List of the genera and species of *Shells* found in each place; referring to the tab. and fig. in my plates wherein they have been delineated.

I will take this opportunity of requesting the increased attention of all the kind correspondents and contributors of Shells for this Work, to the giving of the name and precise situation of the place (by bearings and distances from one or more adjacent towns) whence their specimens were taken, that have already, or may hereafter be sent to me, and the kind of stratum in which they were imbedded: and from such as are possessed of Mr. Smith's Map, I should be glad to receive the mention of the name of the stratum to which each Shell belongs, that I may be enabled to publish the same with its description, and to mention its cotemporary Shells in my future numbers.

An arranged List of Strata, Shells, and Places, by Mr. Farey.

GRAVEL and alluvial Clay, Sand, &c.; which extraneous rubbish is peculiar to no particular substrata.

Ammonites quadratus, tab. 17, f. 3, Brandestone
Terebratula lata, tab. 100, lo. Gisleham
ovoides, tab. 100, u. ditto
Unio uniformis? tab. 33, f. 4, Felmersham
Vivipara fluviorum? tab 31, f. 1, Wapping (London Dock)

Bagshot-Heath Sand, supposed to be the highest of the regular British strata. Perhaps the Crag-marle may be in this situation. (None of its Shells yet described herein).

London Clay, upper part, blue, with imbedded Septaria, &c. (*dun blue*, in Mr. Smith's map.) (See some account of the limits of this stratum in p. 11).

Ammonites acutus, tab. 17, f. 1, Minster Cliff
Ancilla aveniformis, tab. 99, m, Barton Cliff
turritella, tab. 99, la. ditto
Avicula media, tab. 2, Highgate Archway
Cardium nitens, tab. 14, lo r. le. r. lo le. ditto
Cassis carinata, tab. 6, u. ditto
striata, tab. 6, lo. ditto
Cypræa oviformis, tab. 4, ditto
Dentalium entalis, tab 70, f. 3, Hordle Cliff
incrassatum, tab 79, f. 3 and 4, Highgate A. Richmond
nitens, tab. 70, f. 1 and 2, Highgate Archway
planum, tab. 79, f. 1, Bognor
striatum, tab. 70, f. 4, Barton Cliff; Hordle Cliff
Fusus longævus, tab. 63, ditto, ditto, Muddyford
Infundibulum obliquum, tab. 97, f. 1, ditto, Brockenhurst
spinulosum, tab. 97, f. 6, ditto
tuberculatum, tab. 97, f. 4 and 5, ditto
Lingula tenuis, tab. 19, f. 3, Bognor
Melania sulcata, tab. 39, m. Stubbington Cliff
Modiola depressa, tab. 8, u. Highgate Archway
elegans, tab. 9. le u. m. lo. Bognor, Highgate Arch-[way, Richmond-Park Well
Murex Bartonensis, tab. 34, lo. Barton Cliff
trilineatus, tab. 35, f. 4 and 5, Brentford, Highgate A.
Mya intermedia, tab. 76, f. 1, Bognor
subangulata, tab. 76, f. 3, Barton Cliff
Natica glaucinoides, tab. 5, u. Highgate Archway
similis, tab. 5, m. Bognor, Highgate Archway
Nautilus centralis, tab. 1, le. Richmond-Park Well
imperialis, tab. 1, u. Brentford, Highgate A. Minster C.
zieczac, tab 1. lo. Highgate Archway
Ostrea gigantea, tab. 64, Barton Cliff, or Hordle Cliff
Pectunculus costatus, tab. 27, f. 2, Hordle Cliff
decussatus, tab. 27, f. 1, Highgate Archway
Rostellaria lucida, tab. 91, f. 1, 2, and 3, ditto, Islington Tunnel
rimosa, tab. 91, f. 4, 5, and 6, Barton Cliff
Scalaria acuta, tab. 16, lo. ditto
semicostata, tab. 16, m. ditto
Serpula crassa, tab. 30, Barton Cliff, Highgate Archway
Solarium discoideum, tab. 11, u. r. Barton Cliff
patulum, tab. 11, lo. r. le. Highgate Archway

London Clay, &c.
Solen affinis, tab. 3, Highgate Archway
Strombus amplus, tab. 30, Barton Cliff, Highgate Archway
Teredo antenautæ, tab. 102, Highgate A. Minster C. Southend
Trochus agglutinans, tab. 98, sm. Barton Cliff
Benettiæ, tab. 98, la. ditto
Turritella brevis, tab. 51, f. 3, ditto
conoidea, tab. 51, f. 1 and 4, Barton Cliff, Highgate [Archway, Stubbington Cliff
edita, tab. 51, f. 7, Barton Cliff
elongata, tab. 51, f. 2, Barton Cliff, Christchurch
Venericardia planicosta, tab. 50, Bracklesham Bay
Vivipara coneinna, tab. 31, f. 4 and 5, Barton Cliff
lenta, tab. 31, f. 3, ditto, Hordle Cliff

Crag Marl, or soft Limestone, sometimes mixed with *Gravel* on the surface.
Ammonites binus, tab. 92, f. 3, Bramerton. *Qu.* London Clay [or Alluvial?
serratus, tab. 24, Worlingham
Balanus crassus, tab. 84, f. 2, Holywell
tesselatus, tab. 84, f. 1. Bramerton
Cardium Parkinsoni, tab. 49, Harwich, Norfolk
Dentalium costatum, tab. 70, f. 8, Holywell
Emarginula crassa, tab. 33, u. ditto
reticulata, tab. 33, l, ditto
Infundibulum rectum, tab 97, f. 3, ditto
Lingula ovalis, tab. 19, f. 4, Pakefield
Murex contrarius, tab. 23, Holywell
corneus, tab. 35, u. Aldborough, Holywell, Walton-Nase
rugosus, tab. 34, Harwich, Holywell, Walton-Nase
striatus, tab. 22, Holywell
Mya lata. tab, 81, Bramerton
Natica depressa, tab. 5, Woodbridge
Scalaria similis, tab. 16, u. Bramerton, Holywell
Terebratula obsoleta? tab. 83, f. 1, Gunton
Trigonia clavellata? tab. 87, ditto
Turbo littoreus, tab. 71, f. 1, Bramerton
rudis, tab. 71, f. 2, Aldborough
Turritella conoidea? tab. 51, f. 5, Holywell
incrassata, tab. 51, f. 6, ditto
Venus equalis, tab. 21, Elmsett, Holywell, Woodbridge
Vivipara suboperta, tab, 21, f. 6. Holywell

London Clay, lower part, red, red and white, mottled and white,—Potter's and Pipe Clay, and *Brick Earth (brown)*.

Woolwich Loam and green Sand, &c., with layers of chert nodules.
Cardium Plumstediense, tab. 14, r. and l. Plumstead
? tab. 14, m. Bury St. Edmunds
Infundibulum echinulatum, tab. 97, f. 2, Plumstead
Murex latus, tab. 35, le. lo. ditto
Mya plana, tab. 76, f. 2, ditto
Pectunculus Plumstediense, tab. 27, f. 3, ditto
Serpula , tab. 14, m. Bury St. Edmunds

Black-Heath Sand, white, yellow *(light brown)*.

Chalk, upper, soft, with layers of Flints (No. 1, *green*).
Plagiostoma spinosa, tab. 78, f. 1 and 2, Brighton, Northfleet, Rick- [mansworth

Chalk, &c.

Terebratula carnea, tab. 15, f. 5 and 6, N. E. of Devizes, Trowse, [N. E. of Warminster
subundata, tab. 15, f. 1 and 2, N. E. of Warminster

Chalk, lower, hard, without Flints, (No. 1, *deep green*).

Dianchora lata, tab. 8, f. 2, Lewes
Pecten quinquecostata? tab. 56, f. 3 to 8, ditto
Plagiostoma spinosa? tab. 78, Heytesbury, Lewes, N. E. of Norton-[Bavant, E. of Sidmouth
Scaphites obliquus? tab. 18, f. 4 to 7, E. of Brighton, E. of War-[minster
Terebratula semiglobosa, tab. 15, f. 9, E. of Warminster
subrotunda, tab. 15. f. 1 and 2, S. E. of Horningsham, [N. W. part of Suffolk

Fire-Stone of Riegate, Totternhoe, Reche, &c.

Chalk-Marle, with layers of Clunch or whitish Chalk-like Stone, red Cawk, &c.

Ammonites Mantelli, tab. 55, Hamsey, Ringmer
minutus, tab. 53, f. 3, Folkstone
planicosta? tab. 73, Evershot
Arca subacuta, tab. 44, u. Hamsey
Dentalium decussatum, tab. 70, f. 5, Sussex
ellipticum, tab. 70, f. 6 and 7, Folkstone
Hamites adpressus, tab. 61, f. 6, ditto
attenuatus, tab. 61, f. 4 and 5, ditto
compressus, tab. 61, f. 7 and 8 ditto
gibbosus, tab. 62, f. 4, r. ditto
intermedius, tab. 62, f. 2, 3, and 4, Hamsey, Folkstone, [South Horton
maximus, tab. 62, f. 1, Folkstone
rotundus, tab. 61, f. 2 and 3, ditto
tenuis, tab. 61, f. 1, ditto
Nautilus inequalis, tab. 40, lo. ditto
Scaphites obliquus, tab. 18, f. 4 to 7, Hamsey
Terebratula biplicata? tab. 90, Cambridge (Castle-hill), Hunstanton [Cliff
Turrilites costata, tab. 36, Hamsey, St. Catherine's Mount, near [Rouen
tuberculata, tab. 74, Middlesham, Ringmer, Stoneham, ditto
undulata, tab. 75, f. 1, 2, and 3, Hamsey
Vermicularia umbonata, tab. 57, f. 6 and 7. ditto

Green Sand, chloritic and micaceous Sand, yellow, brown, or red, in some places (No. 2, *white*), including the Surry Fuller's Earth.

Arca carinata, tab. 44, lo. Devizes Canal
Cardium Hillanum, tab. 14. u. Black-Down (Whetstone-Pits)
Chama canaliculata, tab. 26. f. 1. Chute Farm
conica, tab. 26, f. 3. Chute Farm
haliotoidea, tab. 25. Dinton, Donhead St. Mary, Stourhead
plicata, tab. 26, f. 4. Haldon-Hill
recurvata, tab. 26, f. 2. ditto
Cucullæa glabra, t. 67. Black-down
Dentalium medium, tab. 79, f. 5. ditto
Dianchora striata, tab. 80, f. 1. Chute Farm
Modiola pallida, tab. 8, r. le. Fonthill
Mya mandibula, tab. 43. Devizes Canal
Nautilus undulatus, tab. 40. Nutfield

Green Sand, &c.
Pecten quadricostata, tab. 56, f. 1 and 2 Armswell-Hill, Chute [Farm, Haldon-Hill, Stourhead
quinquecostata, tab. 56, f. 3 to 8. Black-Down, Chute [Farm, Devizes
Terebratula biplicata, tab. 90, Chute Farm, Longleat, Warminster
intermedia? tab. 15, f. 8. ditto, ditto, ditto
ovata, tab. 15, f. 3. ditto
Trigonia dædalea, tab. 88. Haldon-Hill
spinosa, tab. 86. Black-Down
Turrilites costata? tab. 36. Horningsham
obliqua, tab. 75, f. 4. Devizes Canal
Venus angulata, tab. 65. Black-Down
equalis? tab. 31. Ditto, N. W. of Little Teignmouth (east)
lineolata, tab. 20, u. Black-Down
plana, tab. 20, l. Ditto
Vermicularia concava, tab. 57, f. 1 to 5. Dilton
Vivipara extensa, tab. 31, f. 2. Black-Down

Blue-Marl, or Oak-tree Clay (No. 3, *blue green*).
Perna aviculoides, tab. 66. Filley-Bridge, Osmington, Shotover- [Hill, White-Nab

Aylesbury, Purbeck, &c. Limestone, superior or upper Oolite, Kentish Rag, &c. (*bright blue*).
Ammonites cordatus, tab. 17, f. 2 and 4. Shotover-Hill
triplicatus, tab. 92, f. 2. Portland Isle
Melania Heddingtonensis, tab. 39, r. le. Heddington, Shotover-H.
Modiola parallella, tab. 9, u. r. Maidstone
Solarium conoideum, tab. 11, m. Portland
Trigonia clavellata, tab. 87, u. Boulogne, E. of Oxford, Portland [Isle, Radipole
Vermicularia ovata, tab. 57, f. 8. Shotover-Hill

Blue Clay of Thame, &c., under the upper Oolite.
Ammonites nodosus, tab. 92, f. 5. Scarborough

Clay, imbedding the Sussex Marble.
Vivipara fluviorum, tab. 31 f. 1. Bethersden, Farnham, S. E.

Woburn Sand, upper stratum, sometimes loamy Brick-Earth (No. 4, *dun brown*).

Clay.

Woburn middle Sand, or ferruginous Car-Stone.

Fuller's-Earth near Woburn, &c.

Woburn lower Sand, with petrified wood, green in some places (No. 4. *dun brown*).

Clunch Clay, containing beds of Clunch Stone near its top (*dun purple*).

Alum Shale, of Whitby, imbedding Cement-balls, Jet, &c.
Ammonites armatus, tab. 95. Whitby
Modiola depressa? tab. 8, m. Ditto
Orthocera conica, tab. 60, f. 1 and 2. Ditto
Perna aviculoides? tab. 66. S. E. of Bedford

Kellaway Limestone, Straiths? York, North Riding, &c.
Ammonites sublævis, tab. 54, Christian Malford, Kellaway-Bridge, [Wisbeach Well

Brick Clay, with Bituminated Wood; perforated by numerous swallow holes.

Bedford Limestone, the rubble on its surface called *Cornbrash* soil (*yellow brown*).
Ammonites discus, tab. 12. N. E. of Bedford
Ostrea Marshii, tab 48. Felmersham
Terebratula digona, tab. 96. Chatley, Felmersham
intermedia, tab. 15. f. 8. Chatley, Felmersham
obovata, tab. 101, f. 5. Chatley
obsoleta, tab. 83. f. 7. Felmersham, Wiltshire
ornithocephala, tab. 101, f. 1, 2, and 4. Chatley
subrotunda? tab. 15, f. 1 and 2. Ditto

Clay under the Cornbrash of the Bedford Limestone (No. 5, *white*).
Terebratula digona? tab. 96, f. 1, 2, and 3. Bradford Lo. Pickwick

Barnach, or Coral Rag, durable free Limestone, numerous small and broken Shells.

Collyweston Limestone and Grey Slate, or Whichwood *Forrest Marble*, with Bones, &c. (No. 6, *light blue*).

Sand.

White free Limestone.

Great Oolite Limestone, or Bath Freestone (No. 7, *yellow*).
Ammonites concavus, tab. 94, 1. Ilminster
elegans, tab. 94, u. E. of ditto
jugosus, tab. 92, f. 1. White Lackington
Cardita abrupta, tab. 89, f. 2. Swanswick
striata, tab. 89, f. 1. Ditto
Mactra gibbosa, tab. 42. Near Bath
Mytilus amplus, tab. 7. Midford.
Terebratula carnea? tab. 15. Cotswould-Hills

Coral-rag, under the Bath Oolite.
Melania striata? tab. 47, 1. Goatsacre

Clay, Fuller's-earth, and Marl, lead-colour and purple, in some places; (No. 8, 9, and 10, *white*).
Terebratula concinna, tab. 83, f. 6. Aynhoe
lateralis? tab. 83, f. 1. Ditto
media, tab. 83, f. 5. Ditto, and near Bath
tetraedra, tab. 83, f. 4. Aynhoe, Banbury

Under Oolite, lower or inferior Oolite, yellow and brown Freestone. (No. 12. *orange*).

Nautilus lineatus, tab. 41. W. of Bath, Comb-Down
Terebratula digona? tab. 96. Near Bath, Tog-Hill
Trigonia clavellata? tab. 87. Little Sodbury
costata, tab. 85. Ditto, and N. W. of Oxford

Northampton yellow and brown Sandstone and Sand (No. 13, *orange*).

Blue Marl, whitish upper Lias Clay, producing Mineral Springs, Bones, (No. 14, *faint blue*). Nine places of Belemnites herein are mentioned, p. 128.
Ammonites ellipticus, tab. 92, f. 4. Charmouth Cliff
planicosta? tab. 73. Craymouth, Exmouth
stellaris, tab. 93. Lyme-Regis
Dentalium cylindricum, tab. 79, f. 2. Exmouth
Terebratula ornithocephala? tab. 101, f. 4. Pickeridge-Hill

Marston or Melbury Marble, and ferruginous Marble, Green Sand, &c. (No. 14, *faint blue*).
Ammonites planicosta, tab. 73. Marston-Magna, Sherborn-Park [Well, and N. E. of Yeovil
Scaphites equalis, tab. 18. f. 1, 2, and 3. N. E. of Yeovil
Terebratula crumena? tab. 83, f. 2 and 3. Pickeridge-Hill
lampas, tab. 101, f. 3. Near Lyme Regis

Blue Lias Limestone, water-setting, with blue Clay intervening, Bones, Fish, &c. (No. 15, *dun blue*).
Helicina compressa, tab. 10, m. Leicestershire
Melania striata, tab. 47, u. Lymington
Modiola lævis, tab. 8, le. lo. Barry Isle and near Caerphilly Castle
Plagiostoma gigantea, tab. 77. Near Bath, Cardiff Castle, Pick-[eridge-Hill
Terebratula crumena? tab. 83, f. 2 and 3. Pickeridge-Hill
punctata, tab. 15, f. 4. Hornton Quarry
subrotunda? tab. 15, f. 1 and 2. Ditto

White Lias Limestone and Marl, (No. 16, *dun blue*).
Plagiostoma gigantea? tab. 77. Near Bath

Sand, or soft Sandstone, of Balderton.

Red Marl, upper or marly red, with greenish blue streaks, blue Marlstone, white Sand, soft red Sandstone, or Sand, Gypsum, Salt, &c. (No. 18, *rose colour*). Without organic remains?

Upper Yellow or Magnesian Limestone, light straw-coloured Freestone, deep yellow in some places (*deep blue*).

Middle red Marl, with Gypsum, sulphate of Strontian, tufaceous or conglomerate Limestone, coarse or Millstone grit, &c. (No. 19).

Lower yellow, or buff, Magnesian Limestone, with blue (mild) Limestone beds near its bottom (*deep blue*).

Sand, or soft Sandstone, brown or salmon-coloured.

The strata below this, are found in many parts of the middle and west of England, to lie *unconformably*, having their *edges* covered by the strata last mentioned. See the Phil. Mag. Vol. XLV. p. 167. Of these more ancient strata only such will be mentioned as contain Shells described in this Volume.

12th Coal-shale? of the Derbyshire Series. See Report, Vol. I. p. 161. (No. 20 to 23, *Indian ink*).
Unio subconstrictus, tab. 33, f. 1, 2, and 3. Derbyshire, Wollaton

9th Coal-shale, with muscle-band or dog-tooth Ironstone.
Lingula mytilloides, tab. 19, f. 1 and 2. Walsingham
Mytilus crassus, p. 84, Brit. Min. tab. 386. Wigan
Unio acutus, tab. 33, f. 5, 6, and 7. S. of Bradford Lo. and in Der-[byshire
uniformis, tab. 33, f. 4. W. of Bath, Stavely, Tupton

3rd Coal-shale, with Crowstone and Fire-clay, Limestone and Pyritic Balls, &c.
Ammonites Listeri (p. 132, Brit. Min. tab. 455). Alton, N. of Halifax, (Cathrine-slack?)
Orthocera Steinhaueri, tab. 60, f. 4. N. of Halifax, (Cathrine-slack)

1st Coal-shale, containing beds of Gritstone and of Limestone in some places
Terebratula crumena? tab, 82, f. 2 and 3. Tees River, upper part

Limestone-shale, or great Shale, imbedding micaceous Gritstone, and blue and black Limestone, or Marble, in some places.
Euomphalus catillus? tab. 45, f. 3 and 4. N. of Buxton
Orthocera Breynii, tab. 60, f. 5. Ashford

1st or upper grey Limestone Rock, of the Derbyshire series *(purple blue)*.

Cardium elongatum. tab. 82, f. 2. Bakewell
Euomphalus catillus, tab. 45, f. 3 and 4. Scalebar, N. E. of Tideswell, Winster
Helix carinatus, tab. 10, u. lo. N. of Settle
Orthocera undulata, tab. 59. Scalebar
Productus aculeatus, tab. 68, f. 4. Bakewell
Terebratula crumena, tab. 83, f. 2 and 3. Winster

3rd Limestone Rock, black and white in different places.

Ammonites sphæricus, tab. 53, f. 2. Mill-Dale, S. W. of Castleton, S. E. of Buxton
Productus aculeatus? tab. 68. f. 4. Ditto
scabriculus, tab. 69, f. 1. Ditto, W. of Tideswell

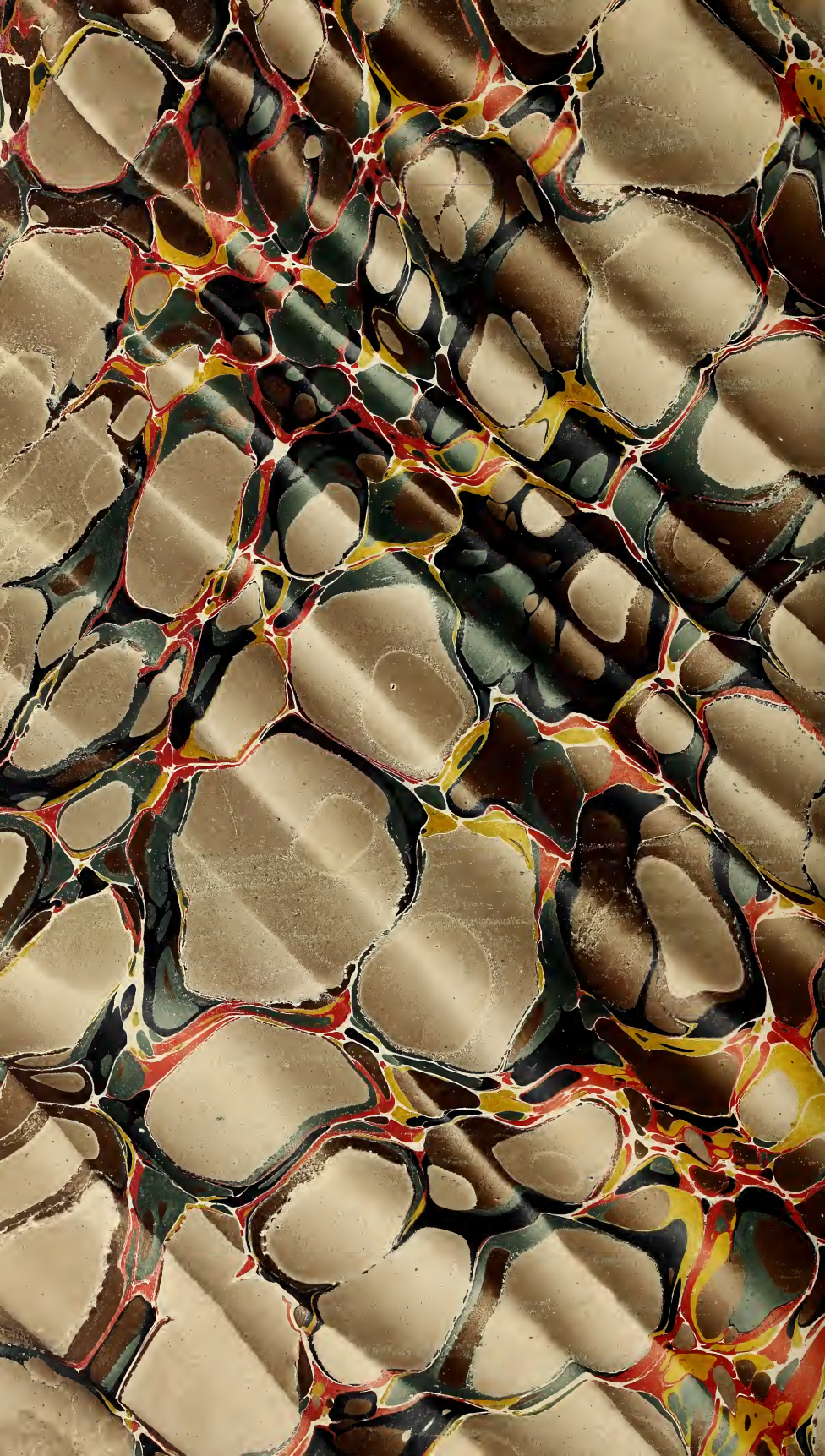
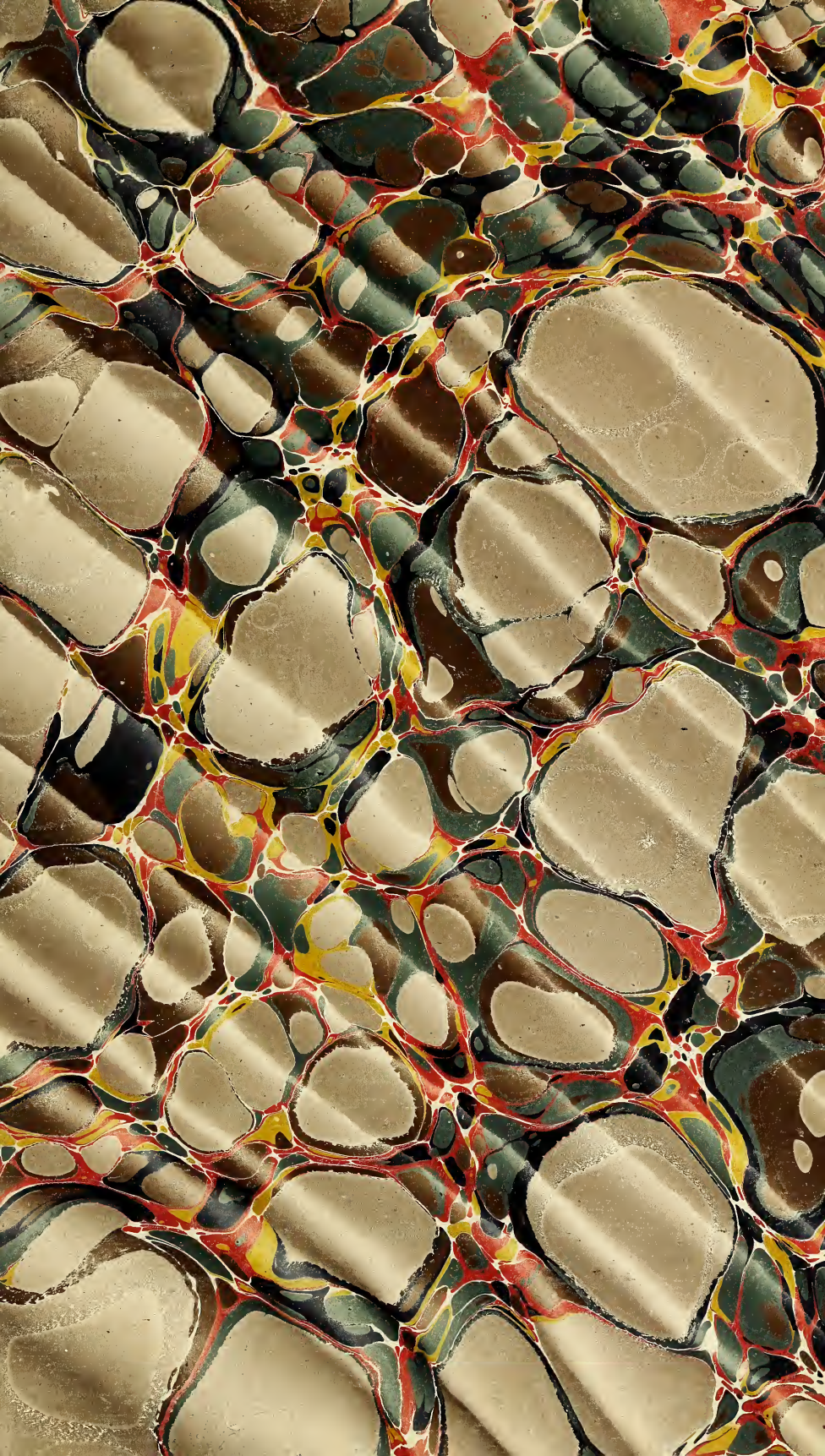
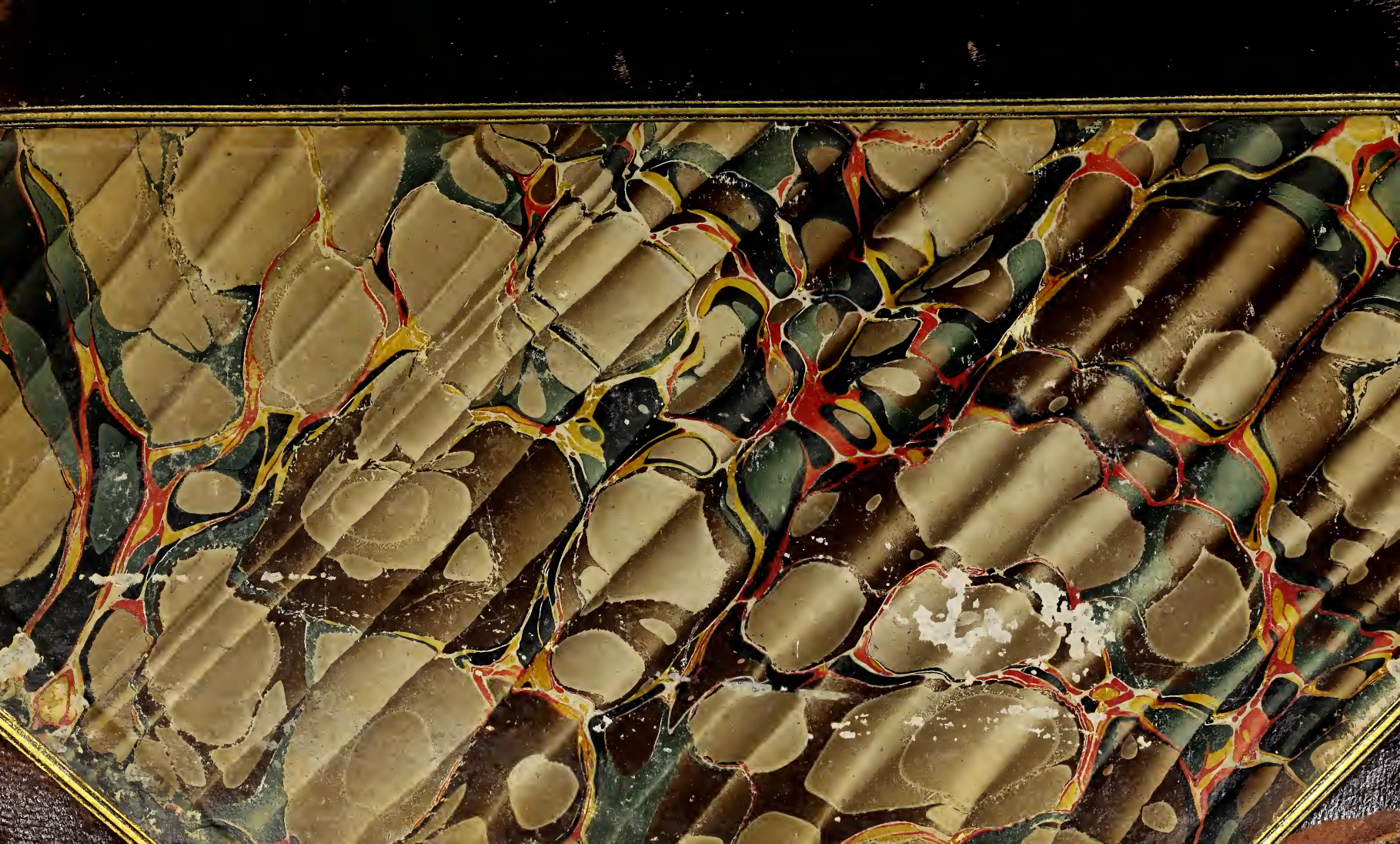
4th, or lowest thick Limestone Rock.

Ammonites striatus, tab. 53, f. 1. Pool's-Hole, Buxton, Castleton

Derbyshire-Peak, or Mountain Limestone Rocks (not distinguished as above), under lying *coal-measures*, and upon coarse *Slate*; very variable in entire thickness, and the nature of its intervening beds, grey, black, red, &c. in different places (*purple blue*).

Amplexus coralloides, tab. 72. (Black-rock), Limerick
Cardium Hibernicum, tab. 82, f. 1 and 3. (Ditto), S. E. of Cork
Ellipsolithes compressus, tab. 38. Ditto
funatus, tab. 32. Ditto
ovatus, tab. 37. Ditto
Euomphalus angulosus, tab. 52, f. 3. Benthal-edge
discors, tab. 52, f. 1. Colebrook-Dale
nodosus, tab. 46. Derbyshire
pentangulatus, tab. 45, f. 1 and 2. Near Dublin
rugosus, tab. 52. Colebrook-Dale
Nautilus discus, tab. 13. Near Kendal
Orthocera circularis, tab. 60, f. 6 and 7. N. of Dudley
striata, tab. 58. Black-Rock, S. E. of Cork
Pentamerus, Aylesfordii, tab. 29. Amestry, Colebrook-Dale, Croft-Ambery Park, Yeo-Edge
Knightii, tab. 28, u. Croft-Ambery Park, Downton
lævis, tab. 28. r. Buildwas, Hopton-Wafers Court
Productus Flemingii, tab. 68, f. 2. (Livingstone?), Linlithgowshire
longispinus, tab. 68, f. 1. Ditto, Kilbride
Scoticus, tab. 69, f. 3. Ditto
spinosus, tab. 69, f. 2 Ditto
spinulosus, tab. 68, f. 3. Ditto
Terebratula biplicata? tab. 90. (Black-Rock?) Limerick
lateralis, tab. 83, f. 1. Near Dublin, (Black-Rock) S. E. of Cork.

☞ Some *errata* having escaped correction in the former Index to this volume, the same will be found corrected herein, viz. Solarium discoideum, Turbo littoreus and rudis, Chama conica (omitted in the Index), Pecten quinquecostata, and Euomphalus angulosus; my readers are requested to correct these with the pen. And in No. VII. pages 73 to 84, two stars (73**, 74**. &c.) should be added, to distinguish the unfortunate repetition of *pages*, which there occur.

When figures of references have been omitted, in several of the plates of this volume, the letters referring to the place in the plate are added in this Supplementary Index; and several *localities* of Shells, before omitted, are here supplied.

The colours of strata herein mentioned refer to Smith's Map.